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## ON THE LIBRARY OF A MEDICAL SCHOOL.[1]

By WILLIAM OSLER, M. D.

One day last spring a London bookseller called and said he had a library of seventeenth and eighteenth century medical books for sale, which had been gathered by the physicians connected with the Warrington Dispensary. Looking over the catalogue I saw at once that it was a collection of value, and knowing that it would supplement very nicely the special libraries which have gradually grown up in connection with the Johns Hopkins Medical School, I wrote to Mr. W. A. Marburg and he authorized me to purchase it and to have it put in good order, and this has been done, and to complete his generous gift, Mr. Marburg has furnished bookcases as well. Dr. Welch will speak of some of the special works. I may mention in passing that the library is very rich in English medical pamphlets of the seventeenth and eighteenth centuries, and contains a large number of the works of classical medical authors which we had not in the library.

A word or two on Warrington and the men who collected these books: This old town on the banks of the Mersey, partly in Chester, partly in Lancashire, had in the middle and latter part of the eighteenth century a notable group of scientific and professional men. The Aiken family made the place celebrated as a literary center, as it was largely through the Rev. John Aiken that the Warrington Academy became so famous. His son John became well known through his "Biographical Memoirs of Medicine in Great Britain," and the large work on "General Biography." A sister of the elder Aiken was the distinguished authoress, Mrs. Barbauld, and Lucy Aiken, a daughter of Dr. John, became a well-known figure in English literature. But by far the most important of the scientific men who lived here in the eighteenth century was Joseph Priestly, who was tutored in "classics and polite literature" at the academy for six years, from 1761. He must have had a very stimulating effect on his colleagues. A very notable character who also has a strong interest for us on this side of the water is Thomas Percival, who was born at Warrington and practiced there before going to Manchester. Upon his work, "Medical Ethics, 1803," was founded the code of ethics of the American Medical Association. I see it stated that a brother of this Percival was also a well-known physician at Warrington, and at his death left a very large library; some of the books may possibly be those before us this evening. James Kendrick was a physician and naturalist of the same type. It was by the exertions of these men and their colleagues that this library was formed. The influence of the Warrington Academy, the educational college of the Unitarians of England, made the town a literary and scientific center, and the medi-

[1] Remarks made on the occasion of the presentation of the Marburg collection of books to the Johns Hopkins Medical School, January 2, 1907.

cal profession must have benefited largely from the intellectual environment of the place. So prominent indeed did it become that a Press was organized, and in looking over Miss Nutting's interesting collection of books on "Nursing," to which I shall refer later, I noticed that from it the works of the celebrated philanthropist, John Howard, were issued. Altogether, the collection has an affiliation with a remarkable group of men, and its value is not a little enhanced to know that it has been used by such men as Priestly, and John Aiken, and Thomas Percival.

The occasion offers an opportunity to make a few remarks upon the future of the libraries connected with this school.

Books are the tools of the mind, and in a community of progressive scholars the literature of the world in the different departments of knowledge must be represented. With the existing arrangements we have gradually built up two libraries, one connected with the hospital and the other with the university. In the former are to be found the modern works and journals relating to medicine, surgery, obstetrics, and the various specialties. Under Dr. Hurd's fostering care this side of the library has grown rapidly, and we have had several valuable donations from the libraries of the late Dr. Donaldson and the late Dr. Chatard. Files of all the more important medical journals are there to be found, and we can all testify to the very stimulating influence which this library had had upon the hospital staff and upon the senior medical students.

After the medical school had opened and the laboratories of anatomy, physiology and pharmacology been erected, the University began the collection which is in this building and which represents the modern works and journals in those scientific subjects upon which medicine is based. There are now very complete files of the scientific journals of anatomy, embryology, physiology, pharmacology, and physiological chemistry. While, in some ways, the ideal plan is to have a special library of each subject in each laboratory, the buildings here are so close together that it was thought best to concentrate all of the collections in this building.

Now it is along these two lines that a library of a medical school should progress, but there are one or two other sides of the question which may be considered. In a large city with another active medical library supported by the profession, the two should work in harmony, as great economies could be effected, particularly in the purchase of the more expensive works and journals. I am glad to know that the library of the Medical and Chirurgical Society is prepared to co-operate with the other medical libraries in this city in some such plan. It is not worth while for the library of the medical school to deal extensively with local literature or with the transactions of the State societies, or to attempt to keep files of all the smaller American journals. There are two other directions in which the library of a medical school should grow, and they are well represented by the collections presented to-night. When a man devotes his life to some particular branch of study and accumulates, year by year, a more or less complete literature, it is very sad after his death to have such a library come under the hammer—almost the inevitable fate. Fortunately, such libraries are very often offered for sale *en bloc*, and this was the case with the large collection of works on teratology and embryology formed by the late Professor Ahlfeld, of Germany. Through the liberality of Mr. W. F. Jencks this very valuable library has been secured for us and will be presented to-night by Dr. Williams. These special groups of books are of the greatest value to the student. It is interesting to know that in connection with the training school of the hospital Miss Nutting has gradually formed a library of all the works relating to nursing and to the care of the sick in peace and war, and I may remind you that we are already the fortunate possessors of another remarkable collection, that of the late Dr. Fisher, who gathered together the set of portraits which was presented to the hospital a few years ago by Dr. Kelly.

This Warrington collection represents a fourth side of the library work. I think you will all agree with me that the interest which has been taken here in the history of medicine and in the biography of the great men of our profession has had a very stimulating influence on the younger men, in giving to them that historical outlook so important in scientific research. The library of a great medical school should contain the original works of all the great masters of medicine. No book should be added to a library simply on account of its age. As in modern literature so in that of the sixteenth, seventeenth, and eighteenth centuries, there is an enormous quantity of trash which is hardly worth shelf room. I would have *all* of the original works of *all* of the great men; and one special value of this Marburg gift is that it is so rich in original editions of many of our masters. For example, I would have in such a library a carefully selected group of the works of Hippocrates, not everything, of course, but the standard editions, such as the Aldine folio, and the editions Frobenius and the more important translations; the editio princeps of Celsus, 1479; the more important of the works of Galen, including the fine Aldine edition, 1525; good editions of Dioscorides, Aretaeus, and of Pliny, and of the other great medical writers of the Greco-Roman school. On the same principle should be collected the chief works of the Arabian physicians, and a shelf or two should be devoted to the school of Salernum. The great medical Humanists should be well represented—Linacre, Caius, and others. Every scrap of the writing of such a man as Vesalius should be collected. A good beginning has been made with the 1543 edition of the "Fabrica," but of such a man all the editions of all his works should be here. The same may be said of such great anatomists as Fabricius, Malpighi, Eustachius, Sylvius, and many others of the sixteenth century. The original works of the great physiologists should be sought for. Every scrap of the writings of Harvey (and they are not numerous) and every edition should be here. In practical illustration of my remarks I beg to present to the Marburg collection an

original edition of the "De Motu Cordis," 1628, perhaps the greatest single contribution to medicine ever made, and which did as much for physiology as the "Fabrica" of Vesalius did for anatomy. The "De Motu Cordis" has become an excessively rare book. I had been on the outlook for a copy for nearly ten years. It had not appeared in an auction catalogue since 1895. Then in August of last year a very much cut, stained and unbound copy was offered to me at a very high figure. It had come from the library of Dr. Pettigrew, the author of a work on "Medical Biography." I had been waiting a long time for a copy, but this looked so shabby and dirty that I decided not to take it. Some months later the booksellers sent the copy back nicely cleansed and beautifully bound, and this time I succumbed. Within forty-eight hours the same dealers sent me another copy from the library of the late Professor Milne Edwards, of Paris, uncut and very nicely bound, which they offered at the same price. Naturally, I took the larger copy and the other one went to a friend in this country. The copy I here present to the library has been a little too energetically cleansed, so that the leaves are very tender and in places have had to be repaired. It came from the library of a physician in London and the bibliographical data are found attached.

I would have the complete works of the Hunters, every fragment available of John Hunter's; everything of Haller—and that means a great deal—of Majendie, and a complete collection of the monographs of great modern physiologists, such as Claude Bernard. The original works of the great clinicians, of Boerhaave, Morgagni, Bichat, Laennec, Louis, Corvisart, Bright, and Addison should be on our shelves; and lastly the great works relating to the history of medicine and to medical bibliography should be collected. Books in the special historical and bibliographical department of the library could very well be added to this Warrington collection, in which way the university could express its appreciation and gratitude for the very generous gift received from Mr. Marburg.

And one word in conclusion—when the plans for the medical school were under discussion, I drew in outline what I should have liked to see on this plot of land. Very much idealized it would have taken many millions for its realization. Surrounding the entire square ran beautiful stone cloisters (ornamented with busts and statues of the great men of the profession), and uniting the four chief buildings which stood in the middle of the sides of the square. On the Monument Street front was a beautiful structure in stone devoted to the library and museum. This part of my plan could yet be realized. As the museum collections grow, and as year by year the books increase in number such a building will become a necessity, and in it these special libraries will find their appropriate home.

# SOME ANA OF THE MARBURG COLLECTION.

By M. L. RANEY,

*Assistant Librarian of the Johns Hopkins University.*

In the present paper no attempt will be made to stand upon other than native, or rather invaded, ground. Neither a physician nor the son of a physician, with a view of the science even in broad outlines as yet foreshortened, it would be effrontery in me to appraise this collection as documents in the history of medicine. Nor would it be very edifying to abstract a premier on the subject and of the titles mentioned underscore those which we now possess. As Dr. Cushing kindly suggested, in extending this invitation, there are many interesting details concerning them as books, regardless of their medical contents.

I am asked to appear in the role of bibliographer, a part, be it quickly agreed, entirely too large for a young head, since it can be acquired only by long years of cumulated detail, and yet one to which I could not confine my interest. The bibliographer is said to write about books, treating of their authorship, printing, publication, etc. This is to be an intellectual mechanic. The librarian cannot be thus occupied wholly. He may exercise himself in bibliography, but if his higher powers would not suffer atrophy, he must be ill-contented to limit his attention to these carriages of human thought, as to any other mere trappings of greatness. The busying of one's self exclusively with the externals of a volume has no appeal for me. As chest-weight and dumb-bells in the spare hour it is worth employment, but the metamorphosis into a walking catalogue is mental pugilism. Of the great divisions of human thought it is his professional duty to keep his knowledge bright, not to mention a thorough acquaintance with library economy, which will occupy the bulk of his official hours, and without which he is a luxury incalculably expensive to his institution. The librarian who guards but cannot unlock his treasures is a survival of the Middle Ages. The master results under great rubrics he, as any intellectual man, should have in mind as a part of his working force. But the small labor, in minute divisions, with all its temporary scaffolding of intricate technology, he may pass over, and await the stroke of genius that brushes aside processes, brings unity out of detail, and fixes one more clear truth in the record of our race. The large accomplishment in all extensive fields should be a part of the fiber of him, and professionally he should be able to perform the mechanical service of pointing out the fields where important work is building. Of

those who have wrought and taught highly, therefore, he may not be satisfied to know the street address in the centuries, and the personal inventory, but have right to knock at the door and find welcome. And yet but little more esteem should be accorded a bibliolater than to any other fawning worshiper of stock or stone. A certain interest does attach to any relic of the centuries, though the book be only a paltry one; just as also to a mummy, which may have been an Egyptian numbskull. It is a noble feeling, however, which prompts one to keep about him the *imagines* of those who have pushed the boundary farther and helped put into our hands the sceptre we hold. They may be grizzly; their frock may not please the trim publishing tailor of the present. But there were princely fashions in many of those days, and even if this could be denied, is it not the true spirit which wishes to see them as they saw themselves? With, therefore, no feeling of the interloper or the coachman I indulge in some ana of this catalogue. And let it be added that this phrase is used advisedly; for if our list of books did not contain great names, it could not rightly demand time of us to detail its words and ways. The fact that we have here the text of many who have made history in medicine must ever constitute its chief interest. But it remains true that these messengers, with their precious script from kingly minds of other days, have had, many of them, an eventful journey hither to our abode. It is a very few of these stories that I would recount—few, since the more inexperienced of us had better be made sure of these than have a mere register of a multitude.

These books are old, we all know. They have come a long way. But how long, and what does this signify? In noting the chronology of these publications, as of all books remarked for their age, we must take caution against kindling enthusiasm too early. In most instances, books are not so old as they seem; and old ones are not all rare. There are many other causes of rarity besides age. It is decidedly more difficult to get first editions of Tennyson's early writings, for example, than a host of books four centuries old. The productions of the infant press, incunabula, cradle-books are in large part rare. Those in the first quarter of a century, *i. e.*, up to about 1480, very rare. These have come from afar. But very few printed since 1650 derive any special value from their age. Books, which are sought, generally get their enhanced values from scarcity. This may arise in many ways; so that in fixing the commercial status of a volume, no man's opinion is to be taken who has not had much experience in the markets of the world. Some of the other causes, besides the wear and tear of time, contributing to scarcity, may be briefly set down here to get a proper perspective in considering this collection's age.

1. There may not now be many copies because there never were many, *i. e.*, the edition was limited. This is generally true of the early presses of the fifteenth century, though not every volume, as noted above, antedating 1500, is rare; since toward the close of that century the editions were large and reprint frequent. Of the first edition of Livy, Rome (1469), only one copy on vellum was issued. Private presses are usually very sparing. Most of the editions of the Shakespearean and other critical essays of J. O. Halliwell-Phillipps were limited to forty copies or even less. Only last year our University library received from the estate of H. R. Bishop a copy of "Investigations and Studies in Jade," two sumptuous volumes limited to 100 copies. Of many books only five or ten copies were published. Under this rubric may also be mentioned local histories and early Americana. If the issue was large enough, it has often been reduced by mishap, especially fire. A striking instance I shall presently have occasion to cite from our own collection. As late as 1899 the entire edition of J. L. Humfreville's "Twenty Years Among our Savage Indians" perished in a Hartford fire, except two copies deposited for copyright in the Library of Congress.

2. The cost of production, either from the extent of the work, or from its expensive materials, also bars wide circulation. Baron von Humboldt used jocosely to remark that he could not afford to own a copy of his own work.

3. Illustrated works may owe their scarcity not only to the cost of their production, but also to the fame of their illustrators, or to the superiority of the first impression, since this becomes duller with each succeeding issue.

4. The first edition of any work may gather interest from the subsequent fame of the author. I have mentioned Tennyson. Remember, too, his friend Edward Fitzgerald, whose rendering of Omar Khayyám's quatrains, "issued in beggarly disguise as to paper and print, but magnificent vesture of verse," in 250 copies; unpurchased save a fifth of it at the end of eight years; put in despair outside the publisher's door in a box marked "All these a penny each"; discovered, among others, it is said, by Rossetti and Swinburne; and then at auction in 1898 a copy bid in by the publisher himself, Mr. Quaritch, at £21.

5. Many books are rarely procurable owing to the printer's renown. Among famous names in the first two centuries of printing may be mentioned Gutenberg, Fust, and Schoeffer in Germany; Aldus Manutius and Giunta in Italy; Caxton, Wynkyn de Worde, and Lettou in England; Plautin and Elzevir in the Netherlands; Froben in Switzerland; Verard, Badius, Estienne, and Wechel in France. In the next two centuries noteworthy names are Bodoni of Parma, Didot of Paris, and Bulmer, Baskerville, Pickering, and Whittingham, in England. A bibliomaniac will pay for an Elzevir cook-book several times its weight in gold. Caxton's, of which only about 650 are known, are almost unattainable. His "King Arthur" (1485) brought £1950 at auction on its quadricentennial.

6. The ban of church or state has enhanced many book values, though the Index Expurgatorius is good advertisement nowadays. Witness Fogazzaro in Italy last year. And the ban of all the good does not prevent the prurient from gathering their so-called "facetial."

A more extended résumé upon the subject of rare books may be found in Spofford's "Book for All Readers," New York (Putnams), 1900. With this caution, let us look at the dates of our collection.

The year 1770 is pretty nearly its center of gravity, about the same number of titles from the total of approximately 1000 being on either side of that date. Indeed one-half is crowded between the years 1750 and 1800. In the sixteenth century we have 33 titles; in the first half of the seventeenth, 37—a total of 70 reached by the year 1650. If now we count from this date by half centuries up to 1800, the totals fall into a rough geometrical progression with ratio of 2; while in the nineteenth century there are but 65 entries. As it is about the earlier volumes that I desire chiefly to speak, let me take you quickly over the few paces back of this date to the invention of printing, that we may appreciate their significance.

Without discussing block-books, produced in the fourteenth century and perhaps in the thirteenth, or entering for a moment upon the age-long controversy as to whether this honor belongs to Gutenberg of Mainz, Germany, or to Coster of Haarlem, Holland; or, as more recently claimed, to Waldfoghel of Avignon, France, and "stepping westward" with our faces away from China, be it sufficient for us to know that the earliest specimen of printing from movable types known to exist was the famous "Indulgence" of Pope Nicholas V in behalf of Cyprus, printed at Mainz in 1454, the first books issued here being two editions of the Vulgate not later than 1455, and the first dated book the Psalter of 1457. Then Italy started to print in 1465, Switzerland in 1468, France in 1470 (according to our best present information), the Netherlands in 1473 (as far as we may be sure), Spain in 1474, England in 1477 (her first printer being Caxton, whose motto, "fiat lux," Tennyson celebrates), Denmark in 1482, Portugal in 1489. Now by 1500 presses were operating in 50 towns of Germany, 71 of Italy, 6 of Switzerland, 41 of France, 22 of the Netherlands, about 25 of Spain, 4 of England, 5 of Denmark and the Northern countries, 23 of Portugal—an aggregate of 227 European towns in which printing was being done by the close of the fifteenth century. Hain (Repert. Bibl.) had listed up to the word "Ugniton," at his death, 16,082 works as published in the fifteenth century. The alphabet completed yields 16,299 titles. Some idea of the output may be gathered from the fact that in seven years' time the first press established in Italy printed 28 works in 11,475 copies. Now, if in this century, there were issued not 28, but over 16,000 works, we need not suppose, despite the gnawing tooth of time, that every volume antedating 1500 is a rarity; and Panzer (annales typographici—a far greater work than Hain's), who lists to 1536, certainly more than doubles this figure. It can be easily seen, therefore, that when our earliest volume, Joannes de Vigo, Opera in chyrurgia (1531), was issued, the number of single copies that had come from the press ran into the millions.

By this time books possessed the chief characteristics which mark them to-day. How many problems those first printers solved. Books were to be printed on rag paper. The sheets were to be folded and printed on both sides. A page was to be given to the title. Upon it or in the colophon were to be recorded the publisher's name, the place and date. Signatures and catch-words were there. The colophon was on the way to yield its functions to the title page. From the pomposity of Fust and Schoeffer in their first signed colophon (1457) is a long cry to the method of our earliest volume. Indeed I am not sure that we have another volume in which no portion of the imprint appears on the title page, all being given in the colophon. It is often the case that fuller information is to be found in the colophon, but the title page is not barren. So in one respect this volume does mark a transition period.

On the score of age, therefore, our collection's earliest volumes do not possess any extraordinary distinction. They are quite valuable, certainly, though I have not taken the trouble to run them down in trade lists to ascertain current quotations. Of course sixteenth century books in medicine do not grow upon trees. They are relatively but not absolutely rare. But as I have already indicated, books have more sources than content and age from which to acquire dignity and interest. One of these is the renown of the printer. We are fortunate in having a number of volumes which have come from famous presses, though not at the period of their greatest éclat. A few are worth mentioning with some detail.

The first is the Aldine press at Venice. There were three Aldines (more properly Manucci) of as many generations—Aldus Manutius, Paulus Manutius, and Aldus Manutius, Jr.,—printing from 1494 to 1597. We have two volumes from this press, Aetius Amidenus (1534) and Oribasius, one of twenty undated Aldines, but known to antedate 1555. These were both issued by Paulus Manutius, not the great founder, whose establishment is one of the most renowned in the history of printing. The death of the founder, occurring when his son, who was to succeed him, was a child, caused an interregnum of uncles, who let the property go down. Aetius was published in "in aedibus haeredum Aldi Manutii et Andreae Asulani," the year following the accession of the son, whose ambition it was to restore the fortunes of the house. This century of work was done in Venice. Venice was the home of more printers than any other city in Europe, and for this reason holds the highest place in the general history of printing. While not as interesting in the history of typography as some other cities, though even in this sphere, in conjunction with the Italian press in general, it has done us one unmeasured service, this city, fortified by the press of its country, is of supreme importance from a literary standpoint. The Renaissance movement, making itself felt throughout the fifteenth century, gained great impetus at the fall of Constantinople. Italy was then sole guardian of the ancient civilization; and fortunately its classics could

pour through her presses into the modern world. More than Queen Mary and Browning might say:

> "Open my heart and you will see
> Graved inside of it, 'Italy.'"

Venice is chief in this service, and her most celebrated son in the closing fifteenth and in the sixteenth centuries was Aldus Manutius. His plant was established mainly for the issue of Greek books. In 1500 he founded the Aldine Academy, the home of so many editors and the source of so many classics in the sixteenth century. Among others enrolled in this academy were Erasmus and Linacre. The device of this printer on his title page is an anchor, around which is curled a dolphin, and his motto, "festina lente." These were never wholly abandoned by the Aldines, until the expiration of their firm in the third generation. The invention of marks or vignettes is ascribed by Laire (Eudex librorum, saec. xv, ii, 146) to Aldus.

I said that Italy, and especially Venice, comparatively uninteresting for typographical history, had yet done one signal service in this field; and that was to fix in use the clear Roman type which we employ to-day in the mass of our printing. This came about in a curious but natural way. Typography was intended, as its name states, to "write with types," *i. e.*, to reproduce and multiply mechanically the current handwriting. Consequently its earliest models were the manuscripts which it printed. These hands would differ with localities, especially with countries. When, therefore, a printer set up shop in a town, he did not carry from the place of his apprenticeship a font of type already cast, but each cut one of his own to match the manuscript he was to reproduce, and these were mostly indigenous. This is almost universally true of the first quarter of a century of printing, and as the early printers so often had no place, date, or publisher indicated in title page or colophon, the study of types is the surest way of fixing in these respects the incunabula. (This method, by which each press is looked upon as a genus, and each product as a species—the natural history method—the method inaugurated by Panzer and well championed by the late Henry Bradshaw of the British Museum, stands in contrast with the method of Dibdin, who described books as curiosities, though Dibdin is still our greatest repository of facts.) So, the two earliest books from Mainz, Germany—the Mazarine and Bamberg Bibles, above referred to, appeared in Gothic type, which is still the national hand of Germany, though how great is the inroad of the Roman type one can see by a glance at current journals from that country. Now upon the introduction of printing into Italy, even though by two Germans, this custom prevailed; and as the scholarly scribes of this period had recently revived the Caroline minuscules of the eleventh and twelfth centuries, it was this beautiful hand which Italian printers reproduced in our Roman type. By the time that Caxton had been printing, say, three years in England (he began with Gothic), *i. e.*, by 1480, printers began to free themselves from the tyranny of the manuscripts, and in the resulting competition, Roman easily won.

The increasing demand also tended to lower prices from about this date, and as a result workmanship deteriorated. This became general by 1500. A shining exception to this rule again is Aldus. And I must not forget to mention that it was Aldus who introduced the use of Italics, said to be an imitation of the handwriting of Petrarch. This type was first used in his Vergil of 1500, though even here the capitals are Roman. We are all familiar with the subsequent narrowing field of this type. A complete register of the Aldine publications, arranged in chronological order may be found appended to the first volume of Ebert's Allgemeines Bibliographisches Lexikon, Leipzig, 2v., 1821-1830.

Schott.—From the press of the learned Strassburg printer of humanistic literature, and Luther's ardent supporter, Joh. Schott, we have an edition of Marianus & Albucasis (1532), our next oldest volume. He is especially noteworthy for his woodcuts, being the first to issue a modern atlas, and what the Germans call a "Situsbild," *i. e.*, a representation of the position of the human intestines, based on autopsy. This cut in Margarita philosophia, and one of the human skeleton, issued afterward as single sheets, spread everywhere and made a great impression, according to the Allg. Deutschr. Biog. (s. v.). In view of the historical value of these woodcuts, one should be well advised of the printer's various devices, which are often our means of recognizing his work.

Fraben.—One of the most important printers in Basel, the first Swiss town into which the art was introduced, and, for a while, surrounded by a group of reforming scholars, the most important in Europe, was Joh. Frobenius, the friend of Erasmus, whose support helped him to that textual accuracy, which, with his beautiful type, especially the Italic, enabled him to rival Aldus Manutius. At his death he was succeeded by his eldest son, Hieronymus, and his son-in-law, Nic. Episcopius, from whose house we have in our collection an Hippocrates (1538), and an Aetius Amidenus (1544).

Wechel.—Another protégé of Erasmus was Christian Wechel, who, with his son and successors at Paris, Frankfurt, Hanau, and Basel, printed from 1522 to 1629. The founder was one of the first to issue Greek and Latin texts in double columns and to get out parts of classical authors separately. While he does not rank as high as Estienne, he attained in Paris an eminent position in the book trade, both from the number and the technique of his issues. His son, Andreas, who succeeded him, sustained the high reputation of the name, but his outspoken Protestant views brought loss and peril, culminating in a bare escape with his life from the Massacre of St. Bartholomew's Night in 1572, when he fled with other Huguenot refugees to Frankfurt. It is from his greater establishment here that our Fernelius of 1577 comes, issued while the great Latin Bible of Tremellius and Junis was in press. Our Dioscorides of 1589, and Falloppio of 1600 were issued by his sons-in-law, who succeeded him, Claude Marin and Jean Aubri. This firm is renowned for the editorial cooperation of Sylburg, from 1582 to 1591.

Giunta.—Another family of Italian printers was the

Giunta, originally from Florence. In the course of time descendants of it settled and printed in Italy, France, and Spain. Of the two brothers, Luca Antonio and Filippo, the former went to Venice and in 1530 established there a press of his own, which upon his death in 1537, passed into the hands of his son, Tommaso, who with his cousins published under the name of Haeredes L. A. de G. till 1657. From this press come our Galen (1609) and Mesue (1623). The work of this firm, however, which was most too much bent on profits, does not compare in excellence with that of the great Aldines. Ebert (op. cit.) in listing the publications of the Juntini's press in Venice concludes with the year 1592. Still it is worth noting that when in the third and last generation of the Aldines the prestige of their press had sunk, that of the Giuntas had at the same time been so gaining that this Aldus Manutius, Jr., sought to mend matters by marrying the great-grandchild of Giunta, the founder of the Venetian press. The fame of the Juntinis, however, rests upon the work of the other brother, Filippo, above referred to, and his sons, Benedetto and Bernardo, who operated in Florence. In both type and paper, the work of these two sons is but little inferior to the best Aldine production. The office closed in 1623.

Plantin.—Christophe Plantin (1514-1589) was one of the most famous of Dutch printers. In execution his work rivaled the best of his time, and many great engravers then flourishing in the Netherlands, illustrated his works. His son-in-law, John Moerentorf (Moretus), and descendants, continued to print in officina Plantiniana, though from the second half of the seventeenth century, the house began to decline. Our Forestus (1610) was issued many years after the founder's death by another son-in-law at Leyden, Francis van Ravelinghen (Raphelenguis), whom he had put in charge of a press, founded and operated by himself for a short time. In 1877 the city of Antwerp having bought the old buildings and contents, which had been kept religiously intact and enriched by the family, opened the Musée Plantin, the most remarkable typographical exhibit in existence.

Elzevir.—A fourth celebrated family was that of Elzevir, Dutch printers, whose activity extended from 1583 to 1712. The members are quite numerous, the most celebrated being Bonaventura, the son of the founder, who had his nephew, Abraham, for partner. The two members of this firm died within a month of each other in 1652, the date of our von Helmont and Jonston from the Elzevir press. They are, however, not the products of this most famous Elzevir firm, but, as also our Harvey, Exercitationes de generatione animalium (1651), were issued by Louis, the third of the name, and great-grandson of the founder. Our fourth Elzevir-Willis (1670), was the work of Daniel, son of the famous Bonaventura, and cousin of the Louis just mentioned, and the latter's partner from 1655 to 1662, after which date he printed alone. While reputed for their classics, the Elzevirs did not equal the Greek and Hebrew impressions of the Aldines in Venice. Their books are more celebrated for the elegance of their types and beauty of paper, than for their critical preparation. Their chief fame rests on their collection of French authors on history and politics in 24 months, known as "Petites Républiques." The family published in all 1213 works, of which 968 are in Latin, 44 in Greek, 126 in French, 11 in German, 10 in Italian, 32 in Flemish, and 22 in the Oriental languages. Their best issues are highly valued, but our three do not belong in this class.

Baskerville.—John Baskerville (1706-1775), footman, calligrapher, stone-cutter, decorative painter, japanner, tamer of a shrew, "terrible infidel," yet the printer of three Bibles, nine Common Prayers, two Psalm Books and two Greek Testaments; "illiterate," but at the commencement of his career announcing: "It is not my desire to print many books, but such only as are books of consequence, of intrinsic merit, or established reputation," and doing so for the sixteen or seventeen years of his publishing, mostly at his own risk, in the issue of Milton, Addison, Congreve, Shaftesbury, Ariosto, Vergil, Juvenal, Horace, Catullus, Tibullus and Propertius, Lucretius, Terence, Sallust, and Florus—John Baskerville, "the British Aldus Manutius and finest printer of modern times," is represented in a volume presented to this collection by The Royal College of Physicians of London—Wm. Hunter's Anatomia uteri humani gravidi (1774). This letter-press is the only medical work which Baskerville issued and one of the latest produced under his care, since he died the next year. It is an elephant folio illustrated with splendid line engravings by Strange and others. It was reprinted from lithographic transfers in 1828. In this volume we have a treasure, the *magnum opus* of a great man from a great press. Baskerville's high renown rests not so much upon the scholarly accuracy of his works as his wonderful type, ink, and paper. To secure a letter that would please his fastidious eye, he spent £600 and several years in experimenting. Dibdin (Introd. to the Classics, ii, 556), says: "He united, in a singularly happy manner, the elegance of Plantin with the clearness of the Elzevirs," though his type is calculated for an octavo or even quarto, being too slender and delicate for an imperial folio. The secret of making good ink had been a lost art in England for two centuries before Baskerville's experiments. He got a liquid of a "peculiarily soft lustre, bordering on purple," as Dibdin says again (l. c.). To his paper and ink, his enemies paid an unwitting compliment when they said that "whenever they come to be used by common pressmen and with common materials, they will lose of their beauty considerably." (Nichols, Illustrations I, 813). For a list of his publications, see Tedder, Dict'y of Nat. Biog. (s. v.).

While the name of the great anatomist is on our tongues, I cannot refrain from giving you a peep behind the curtain afforded by a homely-looking volume in this collection. The Scotch surgeon, John Douglas, issued a little "Treatise on the Hydrocele," upon which an anonymous critic under the title "Remarks on Dr. Douglas' Treatise," etc., and an "Answer" from Douglas appeared in quick succession. Upon

a fly-leaf in the back of these three pamphlets which we have bound together, some one, perhaps contemporaneous and at least stirred with choler at the lack of reverence to greatness, has penned the following note: "There was a reply to this answer with the author's name published soon after poor Douglas was dead: I think by one Justomand (Justamond), but it was a paltry performance like his remarks and not worth having. It is said Dr. Hunter put this young fellow upon making remarks upon Mr. Douglas because he happened to be a reader in anatomy." As a penalty, this youth is excluded from the Dictionary of National Biography.

FIELD.—I close this consideration of great printers whose work is represented here, by citing two titles which will show what interesting results might come from investigating the printers alone in these books. Cogan, Haven of Health (1596), and Barrough, Method of Physick (1601), were printed by Richard Field at London. The volumes themselves, aside from their early date, would hardly cause one to pause over them. And Richard Field—perhaps you have never heard of him before. If you look him up, you will find that he was an apprentice of Thomas Vantrollier, who printed North's translation of Plutarch's Lives in 1579; that upon his master's death in 1587 he acquired his interest in this and other interesting publications; that he held all the offices of honor in the Stationers' Company. And yet, though we read further that he built up a "highly valuable and dignified connection," we have not yet struck fire from the flint, and he is not one of the great ones. But one more fact will make us take a fresh grip on our old Haven of Health. Its printer, Richard Field, was the fellow townsman of William Shakespeare and the printer of the first (1593), second (1594), and third (1596), editions of his first (?) poem, "Venus and Adonis," as well as of the first edition of his "Lucrece" (1594). So that in the same year in which he issued our Cogan, Field was setting up copy for "the first heir of my invention," as Shakespeare styled it. Who knows but what the master dramatist, in visiting the printer's shop to talk over the third edition of "Venus and Adonis," picked up and fingered the leaves of this very copy of Cogan? The poet's and printer's fathers had been friends and neighbors in Stratford-upon-Avon. When the elder Field died, it was John Shakespeare, the poet's father, that attested in accordance with the custom a "a trew and perfecte inventory" of all his goods and chattels. When the "Venus and Adonis" was to be printed, what more natural than for the young poet to hunt up his old neighbor to do the work, especially as he had meanwhile been making good headway in London? Of this, as of the remaining first quarto edition of Shakespeare's poems and plays, our University library has facsimiles.

ST. PAUL'S CHURCHYARD.—We should perhaps get pickings rich enough if we had patience to pry into these old imprints. For example, in scores of these books, we meet here a phrase running something like this: "Printed (or sold) by ———, at the sign of the Lamb (for instance) in St. Paul's Church-Yard." Now this was a well-known book-dealer's quarter of those days. The history of this section is intimately connected with that of early English printing. For a great many years after its foundation, the output of the English press was extremely scanty, and almost entirely of popular character. It is Gibbon's sneer at Caxton that he never printed a classic. The best manuscripts and workmanship were to be had abroad, and the foreigner could undersell the native. This continued on into the sixteenth century. Indeed up till about 1516, with the exception of Caxton and Hunte, the Oxford bookseller, not one English name as printer or bookseller is found in the colophon of a book printed in or for England. But when the revival of letters became more felt and the demand for books consequently increased, the native trader began to feel more keenly foreign competition, and set about meeting it. In addition to legislative enactment curtailing the foreigner's privileges, his method was concentration of business. In St. Paul's Churchyard, where the denizen, perhaps because of liberties afforded him there from the stationers' companies, had early congregated, English shops were also then rapidly set up, till the yard became the beehive of the book trade. In the Sarum Missal of 1500, printed by Dupré, we meet for the first time with the statement that it was to be "sold by the booksellers in St. Paul's Churchyard." Here each shop had out a sign, some design which, with the name of St. Paul's, constituted the owner's address. Thus those of us who wish a copy of Margarita Chirurgica find ourselves reaching for the "Sign of the Spred Eagle, in Paul's Churchyard, near the great North doore," or in Latin we might be trying to reach "ad insigne Cygni Albi in Divi Pauli Caemitaerio." Hippocrates could be had either "at Mr. Bayle's Head" or "at Lord Bacon's Head." But you might get just as good at Homer's Head, Plato's Head, Cæsar's Head, Tully's Head, Horace's Head, Milton's Head, Pope's Head, Sir Isaac Newton's Head, or Turks' Head. But surely a more reliable dealer would be found under the sober signs of the Bible and Sun, Bible and Crown, Black Swan and Bible, Cross Keys and Bible, Angel and Bible, Angel and Crown or the Holy Ghost. Or, if the gift season be at hand, who could scout the artistic appeal of the Peacock, Lamb, Red Lion, Golden Pelican, Brazen Serpent, Swan, Buck, Three Pigeons, Bell, Golden Ball, Ring, or Star, swung out here and elsewhere? Sometimes this shop-sign, it appears, was also the printer's device entered on his title page. We have several neat examples in our list. The Rose may be seen in Freind, Prælectiones chymicae; the Lamb (*ibid.*), Emmenologia; the Swans in Menjot, Diss. pathol.; the Doves in Ballonius, Consiliorum medicinalium, libri ii; the Bible and Crown, in Strother, Experienc'd measures. The signs could doubtless be changed at will. But a good one was perhaps a valuable asset; so that if a printer secured property bearing such a sign, he would keep it. They seem, however, to have belonged to the printers, who could take them when they changed quarters. There was apparently no copyright, since we find three persons living at the sign of the George at one time.

Those mentioned above I selected from the imprints in the Marburg collection. A complete list of London signs before 1558 may be found in E. G. Duff's "Century of the English Book Trade," London, 1905 (Bibl. Soc.), from which many of the facts just given have been drawn.

So much for the printer, his shop and his sign. But of course, books are here which have many other sources of interest than their issue from famous offices, or the authority of their authors in medicine—a field which Dr. Welch has already surveyed. I shall choose but four volumes, all except the first being from the seventeenth century, to each of which an interesting record adheres.

1. Linacre's Galen.—The first of these is Linacre's Latin translation of Galen's De Temperamentis (1521), as reproduced in facsimile in 1881 with an introduction by Dr. Joseph Frank Payne, librarian of the Royal College of Physicians, which added to the Marburg collection a number of titles, especially Hunter's Human Gravid Uterus, issued by Baskerville, above referred to. The original, which was the sixth book ever published by the Cambridge Press, can with difficulty be secured for $200. This volume has a distinction worth mentioning. It was the first book in England to employ cast Greek type, though there are very few Greek words retained from Galen. Greek type was introduced into England two years before, but it was inserted by woodcut. In Edinburgh, as late as 1579, the space for Greek words was left blank and afterward filled in by hand. Greek type had first occurred in Cicero's De Officiis, printed at Mainz in 1465 by Fust and Schoeffer; and a book entirely in Greek had been printed in Milan by Paravisinus as early as 1476, viz.: Lascaris, Greek Grammar.

2. Holland's Pliny.—Philemon Holland's translation of Pliny's Naturall Historie (1601) is an editio princeps of rarity and value, and the most popular of his voluminous renderings. Philemon Holland, who, by the way, died at the age of 85 without ever having worn spectacles, is termed the "translator general in his age," and all his versions are faithful and readable. Besides Pliny, he translated Livy (his first work), Plutarch's Morals, Suetonius, Lives of the Caesars, Ammianus Marcellinus, Camden's Brittannia and Xenophon's Cyropædia. A manuscript of Euclid's Harmonics—a beautiful piece of Greek calligraphy—written by Holland, was borrowed by Baskerville when preparing his Greek font. Our copy of his Pliny has lost the lower half of the title page, so that the imprint is here missing, but a colophon gives the needed information.

3. Burton's Anatomy.—Burton's Anatomy of Melancholy belongs to a class of books denominated ana, containing the sayings and doings of men great in their day. This book fell into neglect after the popularity greeting the first of such publications subsided, and then from being a mere waste-paper book, became extremely rare till reprinted in recent times. Ours is a beautiful copy, though the eighth edition of 1676, the editio princeps belonging to the year 1621.

4. Harvey Exercitations.—In our enthusiasm over Dr. Osler's gift of the editio princeps of Harvey's "De Motu Cordis," we have failed to notice another Harvey title of scarcely less interest than that opusculum aureum, as von Haller called it.

"At Christmas, 1650, Dr. George Ent visited Harvey at his brother's house, and after a conversation which is recorded by Ent, brought away the manuscript of a treatise entitled 'Exercitationes de Generatione Animalium, quibus accedunt quædam de Partu, de Membranis ac Tumoribus Uteri et de Conceptione." This was published in 1651 by Pulleyn in St. Paul's Churchyard, London. The parts of the hen's egg and the growth of the chick within it are fully described, and all the points of growth and development discussed in relation to it." (Moore, Dict'y of Nat. Biog., s. v. Harvey). This work, Harvey's last, except some letters, issued at the age of 73, six years before his death, was at once re-issued in the same year, 1651, by Elzevir at Amsterdam, and again in 1668 and 1674; at Padua in 1660; at Hanau in 1680, and at Leyden in 1737. Of the first Amsterdam edition we have a copy, as already noted. But more interesting is it that in 1653 it was published for the same Pulleyn, with a preface by Ent and a portrait of Harvey, in an English translation under the title "Anatomical exercitations concerning the generation of living creatures: to which are added particular discourses, of births, and of conceptions, etc." With respect to this book W. C. Hazlitt (Bibl. Coll. and Notes on Early English Literature, 2d ser., s. v. Harvey) remarks: "It is said that only 150 copies were printed, and of these 115 destroyed by fire." We have now one of these 35 in good condition, though the portrait has been abstracted, and in re-binding the margins have been shaved. In a recent catalogue of "First editions of one hundred famous books from Homer to Tennyson," J. Pearson & Co., of London, offered a copy in the original calf for 30 guineas.

There are doubtless numerous volumes of no mean bibliographical interest which I have passed over in ignorance or haste. But perhaps some more just perspective has been gained, as we shall approach these issues up to the middle of the seventeenth century, or shall in the future add to them. I felt that many of us, like myself, could be best served at this time by an extended caution regarding the early press. The list of works in the collection up to 1650 I here append for future reference. In this list Harvey (1628) is the gift of Dr. William Osler; and Aldrovandi (1642), Ballonius (1635-36), Farestus (1634), and Harvey (1648) are additions made by the Royal College of Physicians of London. The order is chronological.

**Vigo, J. de. Opera . . . . in Chyrurgia. Additur Chyrurgia Mariani Sancti Barolitani. [Lugduni, 1531]. S.**

**Horatianus, O. Rerum medicarum libri quatuor [etc.].**

**Albucasis. Libri tres. Argent, 1532. F.**

**Aetius Amidenus. Librorum medicinalium tomus premius [etc.]. Venetiis, 1534. Q.**

**Puteanus, G. Ioannis Mesul aloen aperire ora venarum, aliaque similia non pauca dicenda, adversum I. Manardum [et al.], defensio [etc.]. Lugduni, 1537. S.**

Galenus, C. Opera omnia [etc.]. Basileae, 1538. 5v. F.
Hippocrates. Libri omnes [etc.]. Basileae, 1538. F.
Budé, G. De curandis articularibus morbis commentarius. Parisiis, 1539. S.
Fuchs, R. Plantarum omnium quarum hodie apud pharmacopolas usus est magis frequens nomenclaturæ [etc.]. Parisiis, 1541. S.
——. Historia omnium aquarum que in communi hodie practicantium sunt usu [etc.]. Parisiis, 1542. S.
Aetius Amidenus. Medici Graeci . . . . id est sermones XVI per Ganum Cornarium . . . . latine conscripti. Basileae, 1542. F.
Vigo, J. de. Workes [etc.]. [London], 1543. Q.
Vidius, V. (Guido, G.). Chirurgia e graeco in latinum conversa [etc.]. Lucetiae Parisiorum, 1544. F.
Fuchs, L. Apologia [etc.]. Basileae, 1544. S.
Galenus, C. Ars medica . . . . M. Acakia interprete [etc.]. Lugd., 1548. T.
Oribasius. Collectorum medicinalium, libri XVII . . . . I. B. Rosario . . . . interprete. Venetiis [before 1555]. S.
Trallianus, A. Medici libri duodecim, graeci et latini . . . . I. Gumiterio Andernaco interprete [etc.]. Basileae [1556]. D.
Cassius Dio Cocceianus. Romanae historiae libri . . . . XXVI [etc.]. Lugduni, 1559. S.
Avicenna. Libri in re medica omnes [etc.]. Venetiis, 1564. F.
Rorarius, N. Contradictiones, dubia et paradoxa in libros Hippocratis, Celsi, Galeni, Aetii, Aeginetae, Avicennae cum eorundem conciliatonibus. Venetiis, 1566. S.
Paracelsus, P. A. T. Chirurgia . . . . a I. Dalhemis latinitate donata. Argent, 1573. 2v. in 1. F.
Fernelius Ambianus, J. Universa medicina [etc.]. Francofurti, a. m., 1577. F.
Plinius Caecilius Secundus, C. Historia mundi naturalis [etc.], a. m., 1582. F.
Gesner, C. Bibliotheca [etc.]. Tiguri, 1583. F.
Paulus Aegineta. Opera, I. Guniterio Andernaco . . . . intreprete [etc.]. Lugd., 1589. S.
Clowes, W. A proved practice for all young chirurgians [etc.]. [London], 1591. D.
Cogan, T. The haven of health [etc.]. London, 1596. D.
Pinaeus, S. Opusculum physiologum et anatomicum [etc.]. Parisiis, 1597. S.
Guillemean, J. The Frenche chirurgerye . . . . tr. . . . . by A. M. Dost, 1597. F.
Dioscorides Anazarbeus, P. Opera quae extant omnia ex nova interpretatione Jani-Antonii Saraceni [etc.]. N. P., 1598. D.
Phenice (Fenice)—Canal, Dictionaire françois et italien [etc.], [and] Dittionario italieno et francese [etc.]. N. P., 1598. D.
Falloppio, G. Opera omnia [etc.]. Francofurti, 1600. F.
Plinius Caecilius Secundus, C. The historie of the world . . . . tr. . . . . by P. Holland. London, 1601. F.
Barrough, P. The method of physick [etc.], 3. ed. London, 1601. D.
Commentariorum Colligii Conimbricensis Societatis Iesu in octo libros physicorum Aristotelis [etc.]. Coloniae, 1602, 2 pts. in 1 vol. O.
Rudius, E. De ulceribus libri tres. Patavii, 1602. D.
Minderer, R. De pestilentia [etc.]. [Vindobonae, 1608, ?]. S.
Quercetenus, J. Pestis alexicacus [etc.]. Lipsiae, 1609. S.
Galenus, C. Opera ex octava Guntarum editionie. Venetiis, 1609. 5 v. and index. F.
Forestus Alemarianus, P. Observationum et curationum chirurgicarum libri quatuor posteriores [etc.]. [Lugd. Batev.], 1610. S.
Margarita chyrurgica . . . . by S. H. London, 1610. S.
Salerno. Scuola. Medicina Salernitana [etc.]. Francofurti, 1612. T.
Mesue Damascenus, J. Opera [etc.]. Venetiis, 1623. 2 v. in 1. F.
Mercurialis, H. Medicina practica [etc.]. Lugd., 1623. Q.
Jacchaeus, G. Institutiones medicae. Lugd., Batav., 1624. T.
London. Royal College of Physicians, Pharmacopœia Londinensis . . . . tertia ed. [etc.]. London, 1627. Q.
Harvey, W. Exercitatio anatomica de motu cordis et sanguinis in animalibus. Frankfurt, 1628. Q.
Charron, P. Of wisdome three bookes.—Tr. by S. Lannard. London, [1630]. D.
Burgersdicius, F. Idea philosophiae moralis [etc.]. Oxoniae, 1631. T.
——. Idea philosophiae naturalis [T. p., lost. Bd. w. preceding.]
Guybert, P. Le medicin charitable [etc.]. Paris, 1632. T.
Gerard, J. The herball, or generall historie of plantes . . . . Enlarged and amended by T. Johnson [etc.]. London, 1633. [or 1636. T. p. lost]. F.
Hippocrates. Aphorismi, soluti et metrici, interprete J. Heurnio, metaphrastis J. Frero et R. Wintertons. Cantabrigiae, 1633. T.
Forestus **Alcmarianus**, P. Observationum et curationum medicinalium ac chirurgicarum opera omnia [etc.]. Francofurti, 1634. F.
Lowe, P. A discourse of the whole art of chirurgerie [etc.], 3 ed. London, 1634. D.
Poetae Minores Graeci [etc.]. Cantabrigiae, 1635. S.
Hartmann, J. Praxis chymiatrica [etc.]. Genevae, 1635. S.
Ballonius, G. Consiliorum medicinalium, libri ii [etc.]. Parisiis, 1635-36, 2v. in 1. Q.
Woodall, J. The surgeon's mate [etc.]. London, 1639. F.
Plater, F. Observationum in hominis affectibus plerisque corpori et animo, functionum laesione, dolore, aliave molestia et vitio infensis, libri tres [etc.]. Basileae, 1641. S.
Sennert, D. Opera. Parisiis, 1641, 3v. F.
Aldrovandi, U. Monstrorum historia [etc.]. Bononiae, 1624. F.
Galenus, C. Epitome Galeni operum . . . . auctore A. Lacuna. Lugd., 1643. F.
Primrose, J. De vulgi erroribus in medicina, libri iv. Amstelodami, 1644. T.
Schenck **à Grafenberg**, J. Observationum medicarum rariorum, libri vii [etc.]. Lugduni, 1644. F.
Ranchinus, F. Tractatus duo posthumi [etc.]. Lugduni, 1645. D.
Fabricius **Hildanus**, G. Opera quae extant omnia [etc.]. Francofurti, A. M., 1646. F.
Harvey, W. Exercitatio anatomica de motu cordis et sanguinis . . . . Accessit diss. de corde J. de Back. Roterodami, 1648. T.
Sebizuis, M. De alimentorum facultatibus libri quinque [etc.]. Argent., 1650. D.

But with the bars down, one may spend a pleasant hour browsing over such elaborate title pages or frontispieces, not to mention photogravures and illustrative woodcuts, as are to be found in works by such authors as Albertus Magnus, Barbeth, Barry, Blancard, Borellus, Brugis, Charron, Chesselden, Dionis, Douglas, Eustachius, Fabricius **ab Aquapendente**, Fibricius Hildanus, Galenus, Greenhill, Guillemean, van Haller, Harvey, Horstius, King, La Condamine, Le Clerc, van der Linden, Lowe, Menjot, Muys, Nuck, Poole, Quincy, Russell, Ruysch, Sebizius, Severinus, Sibley, Tulp, Willis, Zwelfer, etc.

And even to the student who merely reads the list of author's names a pittance of pleasure and profit will not be denied. In the Middle Ages (and to a certain extent in

the Renaissance and Reformation periods), the Latin language was the universal medium of communication. The writer would Latinize his name also. For the most part, this meant merely to give it a declausional form, the Mundinus de Lentiis is a little removed from Mondino da Luzzi, Christophorus de Questis from Honestus, Vidus Vidius from Guidi Guido, and Bruno from Brown; as elsewhere Copernicus from Zepernik, and Camerarius from Kämmerer. But if the name had a common signification, it was translated into Latin or into Greek with a Latin termination. Thus, Du Bois appears as Sylvius, Hagenbut as Cornarius, Holtzmann as Xylander, and elsewhere Schlüssel as Clavius, Kopflein as Capito, Hausschein as Oecolampadius and Rauchfuss as Dasypodius. Similarly men soon wearied of telling an Arab's pedigree in his name, "long drawn out" enough but hardly "lengthened sweetness," and so a Latin form was substituted. Avicenna is perhaps here to stay for Ibu Sina; and one would hardly have the temerity to suggest that we displace Rhazes with Muhammad Ben-Zacharia Abu-Bekr Al-Razi, or Mesue with Jahja Ben Maseweih Ben Ahmed Ben Ali Ben Abd el-Malik.

Curios are doubtless frequent in the collection. Christopher Nugent has a naive way of stating his proposition which may be recommended to Dr. Cushing's corps of family physicians: "An essay on the hydrophobia: to which is prefixed the case of a person who was bit by a mad dog; had the hydrophobia; and was happily cured." It is a modest soul who withholds his name from the following offering: "The way to health, long life and happiness, or, a discourse of temperance and the particular nature of all things requisite for the life of man, as all sorts of meats, drinks, air, exercise, etc., with special directions how to use each of them to the best advantage of the body and mind. Showing from the true ground of nature whence most diseases proceed, and how to prevent them. To which is added, a treatise of most sorts of English herbs, with several other remarkable and most useful observations, very necessary to all families. The whole treatise displaying the most hidden secrets of philosophy, and made easy and familiar to the meanest capacities, by various examples and demonstrances. The like never before published. Communicated to the world for a general good, by Philotheos Physiologus." But two will not be shaken from my memory soon—the one because our copy has lost its title page and hence I had to read its startling theories in order to trace its author; the other because the title page is present, and very much so. I refer in the first instance to Sir John Hill's burlesque of the Royal Society—"Lucina sine concubitu," etc., published under the nom de plume Abraham Johnson; and in the second to the work of John Snart, who does so in the following title page: "Thesaurus of horror; or, the charnel-house explored!! Being an historical and philanthropical inquisition made for the quondam-blood of its inhabitants! by a contemplative descent into the untimely grave! Shewing, by a number of awful facts that have transpired as well as from philosophical inquiry, the re-animating power of fresh earth in cases of syncope, etc., and the extreme criminality of hasty funerals: with the surest methods of escaping the ineffable horrors of premature interment!! The frightful mysteries of the Dark Ages laid open, which not only deluged the Roman Empire, but triumphed over all Christendom for a thousand years! Entombing the sciences, and subsequently reviving all the ignorance and superstition of Gothic barbarity."

"κούφη σκιά, καὶ ἀτμὶς ἐστιν ἀνδρῶν βίος"

"I could a tale unfold, whose lightest word would harrow up thy soul," etc.—*Shakespeare's Hamlet.*

"But if the fertilizing earth restore
The dubious fragment of a borrow'd life,
Can man's most desp'rate scuffle force the grave,
Or must he, grappling, bathe himself in blood,
And burst his eye-balls in the vain attempt!!!"

# NOTE.

## NEW YORK STATE COMMISSION TO INVESTIGATE THE CONDITION OF THE BLIND.

BATAVIA, N. Y., December 15, 1906.

MY DEAR SIR: The loss of sight in the case of an individual is of economic importance to the State. The New York State Commission to Investigate the Condition of the Blind has been charged, therefore, by the Legislature with the duty of inquiring into the causes of blindness, and of recommending methods by which, as far as possible, unnecessary blindness may be prevented. To that end the commission begs the assistance and advice of the medical profession. The secretary will gratefully receive and acknowledge any reprints, reports, pamphlets—or personal communications bearing on the causes and prevention of blindness.

More especially information is sought on the following points:

*Congenital blindness.*—Its causes, the influence of heredity, consanguinity, etc. The reports of cases of blind parents producing blind children, character of blindness in such cases, etc.

*Ophthalmia neonatorum.*—How generally are preventive measures employed? Statistics bearing on the subject. What silver salt and in what strength should be recommended?

*Trachoma and other infectious eye diseases.*—Statistics. How may early treatment be secured? Prevalence in schools, orphan asylums, etc. Preventive measures—medical inspection of schools.

*Blindness from accident, injuries, fireworks, toy-pistols, etc.*—Statistics. Method of protection for eyes of workmen and others. Prohibition of dangerous explosives at celebrations.

*Toxic amblyopia.*—From methyl alcohol—other toxic agents. How may the public be protected?

*Neglect on the part of patients visiting dispensaries.*—Patients suffering from conditions threatening vision absent themselves from clinics after being advised of the need of immediate treatment until too late. Method of reaching such.

*Blindness due to neglect of slight ophthalmic injuries.*—How can early treatment be more generally secured?

*Blindness due to improper hygiene and sanitation in corneal troubles of children.*—How can early treatment be secured?

*Other causes of blindness.*—Suggestions as to prevention.

The commission will be most grateful for advice and assistance on the above subjects. Very respectfully yours,

F. PARK LEWIS, President, 454 Franklin St., Buffalo.
O. H. BURRITT, Secretary, Batavia.

# ON A METHOD OF PRESERVING OUTLINES OF VISCERAL LESIONS ON NAINSOOK OR SUISSE MATERIAL.

By Howard A. Kelly, M. D.

In the year 1883, I published an article in the *Medical News of Philadelphia* (vol. 43, p. 417), "On the Mapping Out of Visceral Diseases, in an Aniline Color, on the Surface of the Body," describing a practice which I had *introduced* into my wards during my residency in the Episcopal Hospital of Philadelphia. My desire was to secure a graphic representation of pulmonary, pleural, and abdominal conditions in color on the skin of the body, to serve as an ocular demonstration in teaching, as well as to promote the more accurate study of my cases by furnishing an accurate basis of comparison in measuring the changes which might occur from day to day, or week to week. I well remember the amused interest of my chief of the ward, when he lifted the night-dress of a case of pleural effusion and saw the limits of the effusion mapped out in purple on the chest wall. It was soon after this time that this method came into general vogue, both in this country and in Europe, as a valuable adjuvant in the clinical amphitheatre. The idea was too simple and the advantages too obvious to escape the attention of the profession long after the invention of the aniline pencils, and I am not even yet aware whether my own communication was the first upon this subject or not; I can only assert that it was original with me in the year 1883 when I was a hospital resident.

Of late years I have been much impressed with the importance of making more accurate records of the examinations in our gynecological surgical cases; and I have felt in particular that it was desirable to work out some plan of making accurate pictorial records which could be filed away for comparison from time to time. In demonstrating a case, nothing is so impressive as a record which contains both a written description, and, at the same time, an appeal to the eye by means of an accurate pictorial representation. In the early nineties, with these ends in view, through the kind help and skill of my friend, Mr. A. S. Murray, between fifteen hundred and two thousand photographs of patients, of operations, and of specimens were taken in the gynecological service of the Johns Hopkins Hospital. It was at this time that Mr. Murray invented the vertical photographic apparatus to take specimens which could not so well be hung up. These records proved invaluable in the years that followed, as they formed the basis of many of the drawings and illustrations used in our various publications.

The method of describing an abdominal tumor commonly in vogue is, to outline it by palpation, and then to measure its various diameters projected on the ventral surface of the body, in addition to measuring the distance from the periphery of the tumor out to the various fixed points in the abdomen, such as the symphysis pubis, the anterior superior spines, the umbilicus, and the margins of the ribs. In the case of uterine fibroids, I have also long used a pelvimeter to determine the extreme length of the tumor, by placing one arm of the pelvimeter in the vagina on the cervix, and the other on the outside against the abdominal wall on top of the tumor.

These methods are of great value, but they still leave much to be desired, and I think I have attained one further desideratum, in the form of a pictorial record, which is made upon a transparent stiff tissue, laid over the abdomen, upon which the surface markings seen beneath are easily transcribed. More minutely the procedure is as follows: The case is carefully examined, and the tumor or displaced organ, whether a kidney, stomach, uterine or ovarian growth, is carefully outlined on the surface of the abdomen by means of an aniline pencil. I do this commonly by palpating, and following the palpating finger by a series of aniline points on the skin, made about an inch or half an inch apart, thus outlining the tumor or organ on all sides, as the patient lies on her back, with the limbs slightly flexed. Then with the assistance of the nurse, or perhaps of the patient's hands, the transparent tissue on which the record is to be made is laid upon the abdomen and held steadily in one position. The examiner then marks on the tissue the anterior superior spines, the symphysis pubis, and the umbilicus, by means of rapid strokes with an aniline or crayon pencil. Next the tumor is carefully sketched, connecting the points on the skin, seen through the tissue, by a continuous line. After this, the margins of the ribs are outlined, and the breasts, if desired; the outline of the body and the upper thighs, with the crease of the thighs may be added. To get the outline of the body, I hold the tissue out straight from the body, and then looking vertically downwards, sketch on it the outline as seen through the material. If the patient comes back at a future date for a comparative examination, as for example in the case of a fibroid tumor, which may be increasing in size, a similar examination and similar measurements are made independently of the first. The new record is then superimposed upon

Fig. 1.

Fig. 2.

Fig. 1.—Palpating an ovarian cyst seen in sagittal section. The fingers of the left hand rest on the lower pole of the cyst, while the right hand is engaged in determining the limits of the tumor as felt through the abdominal wall. By a succession of short, rapid strokes with the fingers, a sort of vibrating thrill is communicated to the tumor and felt by the vaginal fingers. This is a much more delicate way of outlining a mass than by the usual method of palpation. The rapid succession movement is illustrated in the diagram by making several fingers appear in the place of one.

Fig. 2.—The tumor is first mapped out with an aniline pencil or the skin sprayed with alcohol, at points an inch or more apart, $a^1$, $a^2$, $a^3$, etc. Then a series of further markings are placed between each of these at $b^1$, $b^2$, $b^3$, etc. After this the lines may be connected.

the one first made, when it is easy to determine at once whether there has been any increase or not.

The cost of the nainsook material is, at retail, sixty cents a yard; it is one yard wide, and each yard makes eight pieces large enough to cover the abdomen. The Suisse material costs thirty cents a yard, but is just about one-half as wide again as the nainsook, so the cost is about the same. A close meshed cheesecloth stiffened with starch could be used; this would be much cheaper. The nainsook tissue can be boiled and sterilized and used over the open abdomen, if desired, but in this case it loses its stiffness.

For class demonstration, the records can be fastened on large pieces of white cardboard, which serve to throw the black outlines into prominence.

I observe that sketches made in this way have an individuality never seen in the sketches made in the memoranda of a casebook. This is seen particularly in the outlines of the costal margins, all of which differ. I think it is a great advantage, too, to be compelled, in this way, to spend a longer time in examining the patient. It is also a means of inspiring confidence in the patient, who realizes that the examiner is giving minute attention to the particular circumstances of her case.

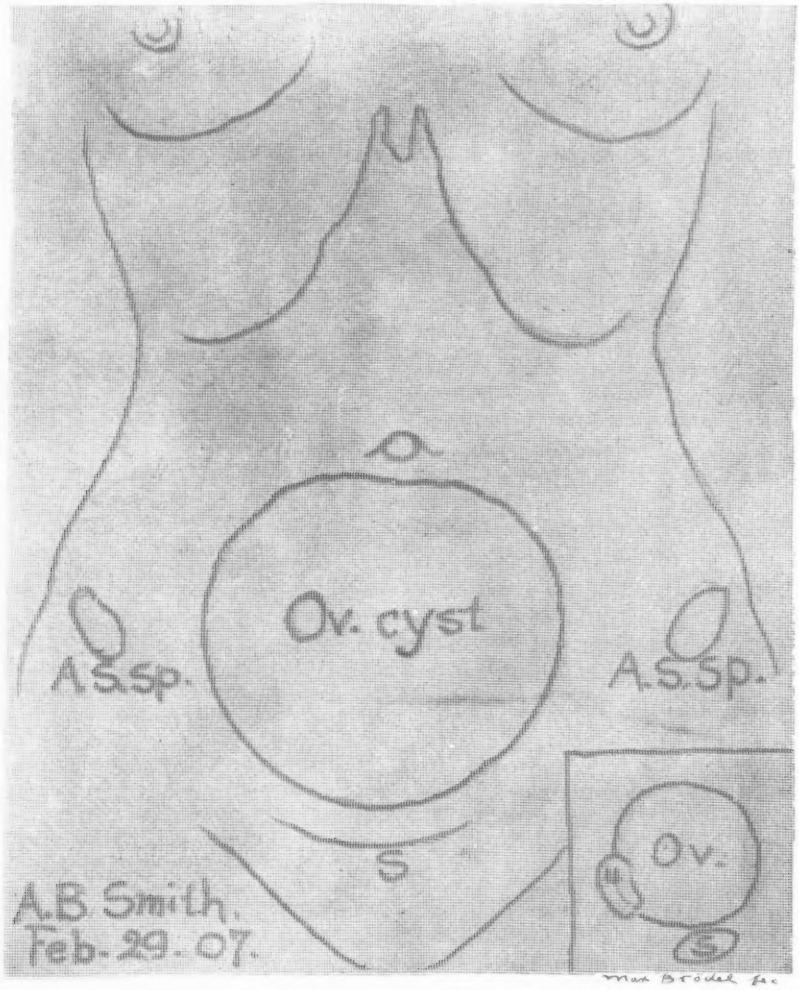


FIG. 3.—The gauze record of the abdomen and its contents. These markings are traced on the gauze material laid on the abdomen with a crayon or black pencil. The name of the patient and any important data are written in one corner and in another corner is an outline in sagittal section of the relation of the uterus to the tumor. If the outlines are all traced on the skin first, a piece of glass can then be laid on the abdomen and with the gauze stretched on this a true geometrical projection can be made.

# A CLINICAL STUDY OF MUSHROOM INTOXICATION.

By WILLIAM W. FORD, M. D., D. P. H.,

*Associate Professor of Bacteriology and Lecturer on Hygiene, Johns Hopkins University.*

The celebrated French mycologist, Paulet,[1] himself a physician, has given us, in a delightful volume, "Traité des Champignons de France," published in 1793, a comprehensive study of the uses to which edible fungi may be put, and has emphasized the dangerous and fatal consequences of the consumption of the poisonous varieties. He points out that from time immemorial mushrooms have been sold, especially during Mid-Lent, in the public markets at Pekin, at St. Petersburg, at Florence, and in various smaller cities and towns in Hungary and Tuscany. Paulet comments with some sarcasm upon the knowledge of fungi shown by the peasants in these countries, and their ability to distinguish between the harmless and poisonous species, compared with the ignorance of the French of that epoch. Historically it is also a well-known fact that the ancient Babylonians and the early Romans employed mushrooms in great quantity, not only as delicacies for the tables of the rich, but as a daily food for the poorer classes. Indeed one of the most beautiful of all our wild species, a plant growing to a height of eight or nine inches, with a top or pileus expanding to a width of seven or eight, of a gorgeous reddish-brown or yellowish-brown color, the *Amanita cæsaria*, owes its name to the favor with which it was regarded by the early Roman emperors. Curious beliefs in regard to this name and species have survived in French literature, however, where occasionally one finds the statement that the name "Cæsaria" should properly be applied to the deadly *Amanita muscaria*, because of its use by the corrupt Latin rulers as a convenient and easy method of disposing of dangerous enemies.

At the period in the world's history when the value of food was necessarily estimated empirically, poisonous fungi were unavoidably consumed in great quantity from time to time, and ancient records attest that fatalities from these plants were by no means uncommon. One of the most interesting if not the earliest recorded case of mushroom intoxication is that experienced by the family of the Greek poet, Euripides. During his absence from home, on one occasion, it is related, in a single day, his wife, his two sons, and a daughter all died from the consumption of poisonous mushrooms.*

On the authority of Pliny, Paulet states, deaths from this cause were by no means uncommon among the consular families of Rome, and he cites among other notables who lost their lives in this way, Pope Clement VII, the Emperor Jovien, the Emperor Charles VI, Berronill of Naples, and the widow of the Czar Alexis. A curious story has come down to us concerning the death of the Emperor Claudius. It seems that this great man, desiring to rid himself of an uncongenial spouse, disposed of her by some one of the many ways open to him as a man of influence, and promptly took unto himself a younger, but alas, no better helpmate. The new selection failed to appreciate the kindly qualities of the Emperor, and according to some traditions, brought about his death by substituting deadly "toadstools" for his favorite edible mushrooms. To make things doubly sure, according to other traditions, mineral poisons were added to the fungi.

It is also related by Paulet that the young daughter of the Greek historian, Pausanius, was severely poisoned but eventually recovered and in Paulet's own century Madame, the Princess of Conti, nearly lost her life by mistaking *Amanita muscaria* for the edible *Amanita cæsaria*. Paulet himself was much impressed by the number of deaths in France, and states that from the year 1749 to 1788 there were a hundred deaths in the environs of Paris alone. Next to Paulet, the French mycologist, Bulliard,[2] did more than any other to systematize the knowledge of fungi possessed by men of that generation, and many of the names and species established by Bulliard are accepted by modern mycologists. To the small white or spring form of the "deadly Amanita," Bulliard gave the name "destroying angel," because of its extreme toxicity, and modern knowledge of this fungus has only served to confirm his observations. Since the time of Paulet and Bulliard, French scientists have many of them devoted much time and attention to the study of mycology and many papers, both popular and scientific in character, have been written on this subject. The various species of fungi have been accurately described, their alimentary value discussed, and the dangerous properties of the poisonous forms emphasized. Indeed in no other country to-day are mushrooms known and loved as they are in France, unless it be possibly in the sunny land of Italy. Many of the theses published by French mycologists are of permanent scientific value, and among them should be mentioned those of Cordier,[3] Bardy,[4] Gillot,[5] and Guillaud.[6] The "Société mycologique de France" was established in 1886 and its Monthly Bulletin is a mine of information to mycologists. In Germany the subject has been approached possibly more from the chemical and pathological standpoint, and a large number of fatalities have been analyzed. Numerous cases of poisoning have also been published in England and in this country. For instance, Palmer,[7] of Boston, collected 33 cases with 21 deaths, and Forster,[8] of Charlestown, 44 cases with 14 fatalities. Other statistics are those of Falck,[9] in Germany, including 53 cases with 40 deaths, of Bardy (l. c.), who reported 60 cases in that district of France known as "Les Vosges," and of Guillaud (l. c.), who estimated the

*Quoted by Paulet from Eparchides.

number of deaths occurring annually in the southwest of France at about 100. From these statistics it may be seen that the mortality from this source depends to a large extent upon the size and the needs of the peasant population. In Italy and France, for instance, and in certain parts of Germany, fungi are utilized in great quantity by the poor who either collect them for their own consumption or who bring them to the public markets where they command a high price for their value as delicacies. In these countries deaths from mistakes are not infrequent. Similar conditions prevail in Japan, where a large and indigent peasant population compels the use for food of nearly every plant that grows, especially during some of their devastating famines. Inoko,[10] for instance, has reported over 480 cases of mushroom intoxication during a period of eight years. Contrasted with these figures we find that in England and America, where there is no abjectly poor element in the population, the deaths from this cause are relatively few in number and belong to two distinct categories. On the one hand there are the frequent cases in which crass ignorance is responsible for the fatality, deadly fungi being picked and eaten because of their beautiful color, the victims possessing absolutely no knowledge of the properties of fungi or of the poisonous and edible species. On the other hand, many of the victims are foreign-born, natives of Russia, Poland, or Bohemia, who are perfectly familiar with the appearance of edible fungi at home but are deceived by the variations in color which the species present in other localities. A case in point is that of the Count de Vecchi, in Washington, who was supposed to be an expert on the subject of fungi, but who died from eating species containing muscarine, probably *Amanita muscaria.* In German, Italy, and France strict laws have now been passed regulating the sale of mushrooms, but fatalities occur regularly from what appear to be unavoidable errors.

In Canada and in the United States the loss of life annually from poisonous fungi is not great, unless we estimate the proportion of deaths from this cause to all the deaths due to accidental causes. During the summer of 1905 there were about 30 cases of poisoning with 12 deaths, and during the season of 1906 there were 15 or 16 deaths.

While mushrooms do not rank high in the scale of foods from their nutritive value, Mörner[11] and Mendel,[12] having both pointed out that the amount of available proteid in them is surprisingly small, they possess a delicacy of flavor highly prized by epicures, and the cost of procuring them, at least in the natural state, is limited to the labor of collection. Furthermore, mushrooms contain in addition to albuminous material, such substances as sugars, starches, and easily decomposed glucosides, all of which may play a not unimportant part in maintaining the nutrition of the body. There is no reliable method of testing the edibility of mushrooms, an expert knowledge of species being necessary for all who would indulge in them. Drying does not destroy the toxicity of the poisonous varieties, the active principles in all cases being heat-resistant. It seems inevitable, therefore, that deaths should occur from time to time and it thus becomes a matter of much interest and some importance to discuss briefly the forms of mushroom intoxication and to put on record the fatalities from the various species. Gillot (l. c.), in 1900, collected over 200 authentic cases of poisoning, most of these occurring in France, and I have been able to find nearly as many more in the German and English literature, and in the French since 1900.

### Poisoning by Amanita phalloides.

*Amanita phalloides,* known commonly as the "white" or "deadly Amanita," and the closely related species, "Amanita verna" (the destroying angel of Bulliard), is the cause of by far the majority of fatalities from mushroom eating. It has been described under a number of different names, such as *Amanita bulbosa,* Pers., and its varieties—*alba, citrina, virescens* and *olivacea, Agaricus bulbosus,* Bulliard; *Amanita viridis,* Pers.; *Amanita mappa, Amanita viresa,* Fries, and *Amanita venenesa,* Pers., while the terms *Amanita recucita,* Fries, and *Amanita porphyria,* Fries, probably indicate the same species. In French literature it is known as "l'oronge ciguë," "l'oronge blanche ou citronée," "l'oronge ciguë jaunâtre," and "l'oronge souris." In German it is popularly called "Knolblätterschwamm." The species indicated by these various names has a characteristic appearance and is readily recognized by ordinary collectors of fungi. It usually grows to a height of five to seven inches and it consists of a base or expended cup (the poison cup) upon, or more properly speaking, within which rests the stalk. The latter is surmounted by an expanded top or pileus on whose under-surface are attached the gills covered with white spores. The plant is pure white in color with the exception of the pileus, the upper surface of which varies from a china-white to an amber or pale yellow. Occasionally the top is greenish in color, especially in Europe, but the greenish plants are practically never seen in this country. The cup, the stalk, the under-surface of the pileus and the gills are always pure white with the possible exception of a few flakes of yellow rarely seen on the stem. The pileus is usually smooth but at times delicate flakes or scales easily removed by brushing lightly with the fingers, are found on the upper surface. The *Amanita verna,* regarded by many mycologists as merely the spring form of *Amanita phalloides,* differs from the latter only in size and color. This form is always pure white, has few or no scales on the pileus and grows to a height of but four to five inches. Much smaller forms are very abundant in the early spring, possibly the most common variety being a plant only about two and a half to three inches tall, with a pileus measuring only one to one and a half inches in diameter. In all these species the color of the spores may easily be ascertained by allowing the pileus to rest gills downward upon a sheet of paper or a piece of smooth wood. After the lapse of three or four hours the spores are deposited upon the wood or paper in a design representing the arrangement of the gills and with a color characteristic for each species.

This is the "spore print." Neither *Amanita verna* nor *Amanita phalloides* are difficult to recognize and both forms are very abundant all over the United States. I have collected them in large quantities, for instance, in the Blue Ridge Mountains of North Carolina, Maryland, and Pennsylvania, in the neighborhood of Woods Hole, Mass., and on the adjacent islands. They are furthermore very common in New York, Pennsylvania, and Ohio, and they apparently enjoy a universal distribution. Nearly all the cases of poisoning reported in this country during the past few years are due to these two species. Closely related species, such as *Amanita cothurnata* and *Amanita relatipes*, although differing from *Amanita phalloides* in certain morphological features cause an intoxication apparently identical with that due to the "phalloides" and evidently harbor the same poisonous principles.

The clinical symptoms of this form of intoxication are characteristic. A prodromal stage of six to fifteen hours in which no symptoms are observed by the victims is followed by a sudden attack of extreme abdominal pain accompanied by vomiting and diarrhœa. Vomitus and stools consist of undigested food with much blood and mucus. Anurea is usually present and rarely constipation is seen. Hæmoglobinurea has never been described, and in many cases specific statements are made as to the lack of coloring matter in the urine. Paroxysms of pain and vomiting alternate with periods of remission, the extreme suffering producing a Hippocratic facies characterized by the French as "la face vultueuse." The loss of strength is rapid and excessive. Jaundice, cyanosis, coldness of the skin, especially of the extremities, develop within two or three days, followed by profound coma and death. The course of the disease lasts four to six days in children and eight to ten in adults. Ocular symptoms and convulsions are rarely noted, but both may occur, the convulsions appearing as a terminal event more common in children than in adults. If large quantities of the fungus have been eaten a very profound intoxication develops and death may occur within 48 hours. The mortality in this form of intoxication is very high, varying from 60 to 100 per cent in different epidemics and death may follow the consumption of surprisingly small quantities. Plowright,[13] for instance, has reported the death of a child of ten years from eating one-third of the top of a small plant, and there are numerous deaths reported from eating one or two good-sized specimens. Cooking these fungi does not destroy their toxicity, the majority of accidents occurring with well cooked material. The strength of the poisonous principles is apparently lessened, however, since smaller quantities of the raw plant can produce a fatal result than when the plants have been thoroughly heated.

The cases recently reported by Pfromm[14] are so typical of nearly all the epidemics that they may well be quoted as representing the usual course of events. A family of Italians living near Philadelphia collected one Sunday a large quantity of mushrooms which they cooked and ate about six o'clock in the evening. The parents ate largely of the fungus, the two children merely dipping bread in the juice and eating the well-soaked bits. About midnight all members of the family were awakened by the most violent abdominal pain accompanied by vomiting, headache, and extreme thirst. The family was visited the following morning by a physician. He found the family all seriously ill, the father profoundly prostrated, cyanotic, with muscular twitching about the chest. The patient soon became delirious, with glazed eyes and contracted pupils. His symptoms were somewhat ameliorated during the day but towards evening they returned with equal severity. For a period of eight days periodical attacks occurred, finally resulting in coma and death. During the latter part of the illness the characteristic Hippocratic facies was present to an extreme degree. The mother suffered from corresponding symptoms, especially from the vomiting and thirst. She finally developed delirium and coma and died on the eighth day. During her attack she aborted a five-months fœtus. Several similar cases are on record. The two children went into coma after a period of excessive pain and vomiting, dying within an hour of each other, 57 and 58 hours after consuming the juice of the fungi. Specimens of the plants eaten were identified by botanists as *Amanita phalloides*.

Other cases of *Amanita phalloides* intoxication have been reported in this country, especially by Palmer (l. c.), Forster (l. c.), Trask,[15] and McIlvaine.[16] In France poisoning is not uncommon among soldiers on the march and in charitable institutions. The "Bulletin de la Société mycologique de France" has reported 18 fatalities since 1900. Probably the most horrible of all the epidemics reported in that country occurred in October, 1884, at the Orphanage of St. Louis, near Pont de la Maye, Gironde (Faure[17]). Here large quantities of *Amanita phalloides* were gathered by ignorant attendants, and being considered edible, were fed to the inmates of the institution on October 6. Between this date and October 10, a period of five days, eleven children died.

Schröter,[18] in 1885, also reported an epidemic with a high mortality, in Silesia, 10 of the 11 affected persons succumbing. Recovery after ingestion of small quantities of fungi may occur. In this event the individuals suffer extremely for a period of eight days to three weeks, but the severe symptoms gradually ameliorate, the patients gain strength and are eventually restored to normal health. The severity of the intoxication depends almost entirely upon the amount of material consumed and neither children, adults, or old people are exempt from fatal consequences.

The *active principle* of *Amanita phalloides* has been sought from early times, but our first knowledge of any value came from the investigations of Kobert.[19] In 1891 he described a hæmolytic poison in this fungus, considering it a "toxalbumin," and naming it "phallin." This substance he believed to be the active principle. Kobert modified his views in 1900,[20] when he described an additional poison of great strength which he stated to be an alkaloid. Subsequently

Ford [21] confirmed Kobert's early observations as to the hæmolytic substances in *Amanita phalloides*, but on the basis of biological experiments was led to believe that an active toxine existed in the fungus, and to this body he gave the name *Amanita-toxin*. It is probably identical with the so-called alkaloid described by Kobert. Recently Abel and Ford [22] have pointed out that the hæmolytic substance in this fungus is not proteid (toxalbumin) but an easily decomposed *glucoside*. This glucoside, because of its extreme sensitiveness to heat, to small traces of acid and to digestion by pepsin and pancreatin, can play no role in the intoxication in man where the cooked fungi are introduced into the stomach. The *Amanita-toxin*, which is resistant to heat, to acids, and to digestion must therefore be considered the active principal. Finally it has been pointed out by Ford [23] that this hæmolytic substance is frequently present only in small amounts in *Amanita phalloides* and may be absent altogether, while certain edible fungi, *Amanita solitaria* and *Amanita rubescens* contain it in great abundance. The hæmolytic glucoside, therefore, when introduced into the stomach, is certainly harmless and is probably utilized as food.

*Treatment.*—No definite line of treatment can be recommended in *Amanita phalloides* intoxication beyond that adopted for poisoning in general. The thorough emptying of the stomach and intestines is usually brought about in the natural development of the intoxication and should be encouraged rather than checked. Large quantities of morphia or some other anodyne are indicated to relieve the suffering and pain. The excessive thirst should be checked by the administration of any liquids which can be borne by the irritated stomach and infusions of salt solution, the so-called "artificial serum" of the French may be introduced subcutaneously. No drug has any antidotal effect upon the *Amanita-toxin*, and the only hope of successful treatment lies in the attempt to develop curative antitoxic sera, a procedure which Ford (l. c.) has shown to be theoretically possible.

### Poisoning by Amanita Muscaria.

The *Amanita muscaria*, known as the "fly agaric," from the use of its decoction as a fly poison (the "Fliegenpilze" or "Fliegenschwamm" of the Germans) and called in France the "fausse oronge," because of its resemblance to an edible fungus known as the "oronge vraie" (*Amanita aurantioca* resembling, if not identical, with a small *Amanita cæsaria*) is a beautiful mushroom, probably more generally recognized as a poisonous species than is the "deadly Amanita." This is possibly due to its very marked appearance, easily distinguishing it from all other species except the "oronge vraie" (*A. aurantioca*) or to its very bitter taste. Poisoning from its ingestion is by no means uncommon, but the mortality is low, many of the affected individuals recovering without untoward symptoms. Typical specimens of the fungus are very large growing to a height of six to eight inches, with a widely expanded pileus. There is no distinct poison cup, the stem terminating in an expanded bulbous extremity. The stalk is covered with fairly adherent scales which also lie thickly studded on the upper surface of the pileus. The stalk, the under surface of the pileus, the gills and spores are white, although occasionally a few flakes of yellow appear on the stem. The top of the pileus is a beautiful yellowish or reddish-brown in color. This color varies much in different countries. In Italy and France, judging from illustrations, it tends to be a reddish-brown, while in this country it has more of a yellowish tinge. While typical plants are easy to recognize the small or dwarf forms are far more difficult. These forms have few or no flakes or scales in the pileus, the color of which is more decidedly yellowish. In consequence they resemble to a very considerable extent the small or depauperate forms of *Amanita cæsaria*. The fully developed *Amanita cæsaria* is easily recognized by its large size by the smoothness of the pileus, and especially by its development from a universal cup, on the bursting of which the pileus appears not unlike the yolk of an egg surrounded by the white. Finally the color of the *Amanita cæsaria* in typical specimens is far more reddish-brown than that of the *Amanita muscaria*. The chief errors arise either from complete ignorance of the identity and the properties of fungi or from the recognition of the "muscaria" as the "cæsaria" by foreigners. These mistakes may arise in part from certain variations in color shown by the species in different countries. The *Amanita muscaria*, for instance, in some regions of France and Italy has a reddish tinge and the "cæsaria" a yellowish, while in this country the reverse holds true. The "fly agaric" is very abundant in the United States but seems to be somewhat more limited in its distribution than is the "deadly amanita." I have frequently found it in association with the latter in the regions already mentioned, and it is very common in the low-lying, well-matured tracts of land in the vicinity of Baltimore. Cases of poisoning from this fungus are rather rare here, but fatalities have been reported by Forster (l. c.), Cagliéri,[24] and Prentiss.[25] There are many isolated cases reported in the French and German literature, among which may be mentioned those of Orfila,[26] Mautner,[27] Paulet,[28] as well as those collected by Gillot (l. c.)

The symptoms of poisoning are quite distinctive. They appear soon after the ingestion of the fungus, at times almost immediately and frequently within an hour or two. They consist of vomiting, diarrhœa, severe headache, with ocular symptoms (contraction of the pupils, etc.) followed by delirium, a rapid loss of consciousness and terminating in convulsions of the most violent character. Death may result from the intoxication but in the majority of instances, only small bits of the fungus are consumed, owing to their very bitter taste and the effect of the poison gradually wears off. The delirium may be very marked and is followed occasionally by amnesia.

In the cases which recover, the serious symptoms ameliorate rapidly and the period of convalescence once established is short usually, but two or three days. Occasionally fungi either closely related to *Amanita muscaria* or identical with

it lack the bitter principle of the true "muscaria," and are eaten in large quantity with a rapidly fatal outcome.

The poisoning of the Count de Vecchi and his physician in Washington represent an extreme case of this variety of intoxication, and the details are so interesting that the main facts of the excellent report of Prentiss (l. c.) may be repeated. The Count de Vecchi, an attaché of the Italian legation in Washington, considered something of an expert upon fungi, purchased on the street near one of the markets in that city a quantity of mushrooms, recognized by him as an edible species. The plants were collected in Virginia, about seven miles from the city of Washington, and were probably identified by de Vecchi as *Amanita cæsaria*. At breakfast the following morning the Count and his physician, Dr. K., ate the cooked fungi in considerable quantity, noticing their agreeable and even delicious flavor. The breakfast was finished at half after eight, and within fifteen minutes the Count felt symptoms of serious illness. At nine o'clock he was found by his family lying prostrate on his bed and oppressed by the fear of impending death. He developed blindness, trismus, difficulty in swallowing, and shortly lost consciousness. Terrific convulsions then supervened, of such a violent character as to break the bed upon which he was placed. Despite the administration of apomorphia and atropine the Count never recovered from his coma and died on the second day.

The Count's physician, on returning to his office, immediately after breakfast, soon began to be dizzy and to suffer from double vision and other ocular symptoms. He quickly lapsed into unconsciousness, in which state he remained for five hours, with one or two intervals of lucidity. Under treatment with apomorphia and atropine complete recovery set in about seven o'clock in the evening. These two cases represent the extremes of "muscaria" intoxication; on the one hand the profound depression of the nerve centers, resulting in death within 48 hours, and on the other hand the rapid amelioration of symptoms without permanent lesions.

The *active principle* of *Amanita muscaria* is *muscarine*, a chemical substance with the formula $C_5H_{15}NO_3$ and probably an alkaloid. It was first isolated from *Amanita muscaria* by Schmiedeberg and Koppe,[20] and was found to produce experimentally most of the symptoms of *Amanita muscaria* intoxication. Muscarine was later prepared synthetically by the oxidation of choline, but the artificial product is easily decomposed and seldom has the same physiological action that natural muscarine exhibits. As a logical consequence of the knowledge gained of the properties of muscarine, atropine was suggested as a physiological antidote and it has been used with a considerable amount of success.

That muscarine is not the only poisonous principle in *Amanita muscaria* appears from the work of Harmsen[20] who has shown that atropine does not completely neutralize the effect of injections of *Amanita muscaria* in animals. Support is given the contention of Harmsen by the cases reported by Cagliéri (l. c.). Three children, aged 5, 8, and 10 years, ate small quantities of *Amanita muscaria;* nervous symptoms developed almost at once, consisting of restlessness, contracted and then dilated pupils, Cheyne-Stokes respiration, spasm of the muscles of the lower jaw, convulsions, and coma. Despite the liberal use of atropine all three children died within 30 hours. The parents and another child who also had partaken of the fungi, developed the usual symptoms of muscarine intoxication but recovered.

Finally mention should be made of the practice indulged in by peasants of the Caucasus, who prepare an intoxicating beverage from *Amanita muscaria* from which a horrible kind of delirium results. Apparently a certain amount of toleration for the drug develops from its habitual use, although death from a drunken orgie produced by *Amanita muscaria* is not uncommon. Indeed one of the members of the ruling family in Russia is said to have lost his life in this way.

The claim made by McIlvaine (l. c.) that atropine was first used as an antidote for poisonous mushrooms by a physician in Shenandoah, Pa., is not established by an examination of the earlier literature. Schmiedeberg and Koppe (l. c.) in their earliest publications on muscarine suggested the use of atropine in mushroom intoxication and Lauder Brunton in 1874 (Brit. Med. Jour., 1874, Vol. II, p. 617) recommended it for the same purpose. Furthermore, in the cases cited by McIlvaine the fungi eaten were *Amanita phalloides*, upon the effects of which atropine has no neutralizing action, and two of the patients died.

### Poisoning by Amanita Pantherina.

Gillot (l. c.) has collected 30 cases of poisoning by *Amanita pantherina*, but the intoxication is not serious and in but two instances did death result. Cases have also been reported by Faure (l. c.) and by Louriot.[21] The symptoms are apparently due to the action upon the nerve centers of the muscarine which the fungus contains (Kobert[22]). The patients begin to show signs of intoxication within a few hours after eating the mushrooms, suffering from the usual gastro-intestinal disturbances. These are accompanied by great excitement, delirium, convulsive seizures, and a peculiar drunkenness not unlike that described in muscarine intoxication among the Koraks. Ocular symptoms, loss of memory, and syncope are frequently seen. Inoke[23] has reported an interesting series of 32 cases of poisoning from the Japanese variety of *Amanita pantherina*. There was but one fatality among these patients; the sufferer showed peculiar nervous manifestations in addition to vomiting and diarrhœa. Dilatation of the pupils, various hallucinations, the sensation of insects crawling over the skin, visions of reptiles and of beautifully colored snakes—red, yellow and brown—were the most prominent symptoms of the intoxication. The feeling of "bien-être," expressed by singing and laughing was common to all the victims. The patients usually made a rapid recovery, but occasionally the convalescence was prolonged over a period of a fortnight.

From this Japanese *Amanita pantherina*, Inoke[24] has isolated choline and muscarine. He states that in Japan this species is used as a fly-poison, replacing the *Amanita muscaria* (Fliegenpilz), which is rare in Japan and devoid of any special toxic action on flies. *Amanita pantherina* is a yellow-topped fungus which resembles the "fly agaric" in many of its essential characters. It seldom grows in the United States, and Atkinson[25] says that

the species known in this country as *Amanita frostiana* (Peck) closely resembles specimens of *Amanita pantherina* received from Bresadola of Austro-Hungary. No cases of intoxication from this fungus have occurred in America.

### Poisoning by Morells or Helvellas.

According to Kobert[36] there are no authentic cases of poisoning from the true Morells, of which he recognizes five different species. There are, however, over 160 cases recorded of poisoning from the false Morells, properly called Lorchells, of which the most important species is *Helvella* or *Gyromytra esculenta*. This should properly be called *Lorchella esculenta*. Its active principle was isolated by Boehm and Külz,[37] who named it Helvellic acid. It is a hæmolytic substance, acid in reaction, with the empirical formula $C_{12}H_{20}O_7$. It had previously been shown by Boström,[38] and Ponfick,[39] that the poisonous principles in *Helvella esculenta* were completely soluble in hot water, the aqueous extract killing dogs when given by stomach, while the residue left after extraction was quite harmless. The symptoms of intoxication in these animals were the same as when the fresh fungus was fed them, and in both intoxications there was marked hæmoglobinuria pointing to a hæmolytic poison. According to both Boström and Ponfick the toxicity of *Helvella esculenta* disappears or is much lessened when the fungi are dried. Helvellic acid, as obtained by Boehm and Külz is also toxic to dogs when given by mouth, likewise producing hæmoglobinuria, and there can be no doubt that it is the active principle. The Morells are eaten to some extent in the United States, but no cases are on record where the poisonous *Helvella esculenta* was mistaken for them.

### Poisoning from Other Varieties of Fungi.

In addition to the species already described the lethal effects of which are well established, a number of other fungi are credited with poisonous properties, and rarely death has been ascribed to their ingestion. In many of these cases, as in poisoning from *Russula emetica*, the symptoms point to the presence of muscarine in the fungus, together with substances producing a profound gastro-intestinal disturbance. Such fungi have usually a bitter, disagreeable taste and are strongly emetic. In consequence, but small amounts of the plants are eaten, and the violent retching produced soon rids the system of the offending morsels. Certain species of *Phalloideæ* are eaten greedily by animals, especially by swine, with disastrous effects. These plants exhale a very offensive odor and are probably never eaten by man. In Gillot's collection of cases several deaths are traced to the *Volvaria*, but little or nothing is known of the active principle. Finally the *Boletus satanus*, which is believed to be poisonous, is known to contain muscarine.

No cases of poisoning have ever resulted from the use of any of the purple-spored or black-spored agarics.

These plants, like many other foods when slightly decomposed, may give rise to severe intestinal disturbances, with marked prostration. The cases of poisoning reported from the field or meadow mushroom are not authentic. In the majority of instances the fungi said to be *Agaricus campestris* were not identified as such by competent authorities, and where any description of the plants has been given it is apparent that either *Amanita phalloides* or *Amanita muscaria* was eaten by mistake for the ordinary mushrooms. Many fatal cases of "toadstool poisoning" are reported in both medical and lay journals, without any statements as to the fungus eaten. The course of the intoxication and the post-mortem findings point invariably to the consumption of such well-known species as the "deadly amanita" or the "fly agaric." Indeed, in the vast majority of such fatal cases reported, both in this country and in Europe, I am convinced from a careful study of the symptoms that *Amanita phalloides* is the offending species.

**Collectors of mushrooms should limit themselves to the use of well-known species, such as the purple and black-spored Agarics, the edible species of Boletus and certain varieties of Lactarius and Polyporus. White-spored Agarics should always be avoided even if the edible *Amanita cæsaria* or *aurantioca* is thus lost to the pleasure-loving palate. Especially should the *Lepiota* and the *Amanitopsis*, species closely to *Amanita phalloides* be strictly eschewed. While the typical plants, perhaps, are not difficult to identify, specimens of *Amanita phalloides* in which the veil has dropped off closely resemble the *Amanitopsis*, and those in which the poison cup is sunk deep in the ground may readily be mistaken for *Lepiotas*. For an excellent list of edible and poisonous mushrooms those interested in this phase of the subject should consult the last edition of Kobert's Lehrbuch der Intoxikationen.**

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of Boletus and to unknown fungi. The other 4 deaths showed symptoms of *Amanita phalloides* intoxication. He reports 44 additional cases with 14 deaths, including those already reported by Trask (l. c.). Of these cases 26 had symptoms of *Amanita phalloides* intoxication. Of the 14 deaths 7 were due to *Amanita phalloides*, 2 probably to *Amanita muscaria*, while the others were of unknown origin.

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# A REVIEW OF ONE HUNDRED AND FIVE REPORTED CASES OF ACUTE PANCREATITIS, WITH SPECIAL REFERENCE TO ETIOLOGY; WITH REPORT OF TWO CASES.

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The following work was undertaken primarily for the purpose of obtaining an idea as to the relative frequency of the different causes of acute pancreatitis, but in going over the cases other conditions of interest were noted which will be referred to in their place. The studies of Langerhans, Robson, Koerte, Flexner, Bloodgood, Opie, Halsted, and others are so well known that it is hardly necessary to mention them except to make brief references in presenting the present status of the subject.

Bloodgood divides acute pancreatitis clinically into two groups, the first characterized by exudate of serum and blood into the pancreas and peripancreatic tissues usually associated with disseminated fat necrosis and intraperitoneal hæmorrhagic exudate. The second group is characterized by suppuration and formation of one or more abscesses; usually there is more or less gangrene of the pancreas present. He says pathologically, undoubtedly every case of pancreatic abscess passes through the first stage of the disease.

Etiology.—Many causes have been given as etiological factors in the production of acute pancreatitis. Besides gall-stones causing retrojection of bile into the pancreas we have injury and various infections given as probable causes. In cases of retrojection of bile and injury the various organisms as *B. coli communis*, the pyogenic organisms and a number of less common bacteria are frequently met with as secondary invaders, and it seems probable that the more often they are looked for the more frequently they may be found. When we consider the frequency with which bacteria are found in the bile, and the ease with which the pancreas can be infected, due to its position, we can readily see how infection may occur simultaneously with the retrojection of bile or immediately after. In the same way, in the case of injury, a condition favorable for the entrance of bacteria is established, and infection results.

In those cases in which mechanical conditions, as gall-stones or pancreatic calculi, are not the primary cause various conditions may bring about infection. Gastro-duodenal catarrh, especially the alcoholic form, is mentioned by many authors as existing in cases of acute pancreatitis.

The bacterial invasion may be from the intestine through the ampulla of Vater and the pancreatic ducts or, in cases where the bile contains organisms, from the common bile ducts into the duct of Wirsung. Another method of invasion in cases of duodenitis is by direct extension through the wall of the intestines into the head of the pancreas. It is impossible to say how often these different methods of infection occur in a given number of cases. Robson says infection through the ducts is the most common. Infection may take place through the blood-stream or the lymphatic system, but here again we are in the dark as to the relative frequency of infection through these avenues. There is a group of cases in which the method of infection cannot be established—no gall-stones

are present, no inflammatory lesions, and the person has been in apparently perfect health. It would be interesting to know the condition of the bile in these cases and what diseases these patients had had during their lives. When we consider that *B. typhosus*, *B. coli communis* and some of the pyogenic bacteria may live for months and years in the bile it seems not at all improbable that many of these cases may have their source of infection in the gall-bladder. Another possible cause are emboli leading to infarction of portions of the pancreas. Munzer believes giant cells from the placenta may become emboli and cause necrosis of the pancreas.

The pancreatic ferments have been supposed to be able to produce pancreatitis, as Chiari has noticed autodigestion of the pancreas accompanied by multiple small hæmorrhages shortly before death, but, as Pearce states, there is no definite proof that true hæmorrhagic pancreatitis is ever produced by this cause.

Hlava believes that gastric juice may be forced back through the ampulla of Vater by antiperistaltic action of the intestines, and that it may be a cause of pancreatitis, but Pearce has shown experimentally, that under normal conditions this cannot take place; all of his experiments being negative. In going over the published cases of pancreatitis one case of chronic pancreatitis was found in which the gastric juice was supposed to be the cause of the condition, but in this case, a gastro-pancreatic fistula was present through which the gastric juice had gained access to the pancreas, producing a chronic interstitial pancreatitis and not an acute pancreatitis. However, experimentally acute pancreatitis has been produced by Flexner by the injection of artificial gastric juice.

Robson says, that owing to the soft character of the gland tissue, an auto-destructive ferment, which dissolves the wall of the blood-vessels and produces a hæmorrhage, is set free by any injury to the pancreas however it may be inflicted.

Carnot, on the basis of a large number of experiments, concluded that the intensity of tissue alterations was more a cause of gland changes than the nature of the exciting agent. He says further, the more acute the symptoms the greater the liability to hæmorrhage which may follow traumatism as well as poisoning by mercury and other chemicals.

Wiener says, "We know that we frequently find infections of the gall-bladder and ducts without the presence of stones. May not such an infection cause so great a swelling of the mucous membrane of the common duct that the papilla of Vater is occluded? We certainly believe that it may."

Robson thinks the causes of diseases of the pancreas are the same as those of the gall-bladder. A reason why the pancreas is less often affected than the gall-bladder, as Truehart states, may be due to the bactericidal property of the pancreatic secretion.

Pearce says there are four possibilities as to the means by which hæmorrhagic pancreatitis is produced in man. 1. Action of ferments originating in the pancreas. 2. Bacteria. 3. Gastric juice. 4. Bile. In regard to the effect of blood on the pancreatic tissues Hart states that this effect is not seen if the corpuscles are removed.

Lancereux states that pancreatic affections are due to a nervous agency or infection. In one of the cases mentioned by Fitz in his Middleton-Goldsmith lectures, Osler and Hodges found round-cell infiltration in the solar plexus.

Deaver says he believes that cases of sudden onset and rapid course will be found to be due in most cases to gall-stones in the ampulla or immediate vicinity; and cases more gradual in onset due to infectious inflammations about the ampulla.

*Fat necroses.*—This was first described by Balser in 1882; and Fitz in 1889 pointed out the relation between pancreatitis and fat necrosis. The first to show the relation between fat necrosis and steapsin were Langerhans and Flexner. The fat splitting ferment coming in contact with fat, splits this into fatty acids and glycerine. The glycerine is absorbed, while the fatty acids combine with calcium salts to form soap. The basis for Cammidges reaction is the appearance of the absorbed glycerine in the urine. This glycerine aside from jaundice is also supposed to be a cause of the hæmorrhagic tendency seen in various pancreatic diseases. Cammidge produced hæmaturia and hæmoglobinuria rapidly in urine by injecting very small amounts of glycerine. In two cases there was a striking diminution in blood platelets compared with normal blood. Opie makes the following statements in regard to fat necrosis. 1. The condition essential to the production of focal fat necrosis is the penetration of the fat-splitting ferment of the pancreas into living adipose tissue. 2. By causing the entire secretion of the pancreas in cat to penetrate into the tissue surrounding the organ, wide diffussion takes place and necrosis results, not only in the abdominal fat but in that of the pericardium and subcutaneous tissue as well, thus reproducing the widespread distribution of the lesion occasionally observed in man and in lower animals. 3. Lesions of the pancreas associated with focal fat necrosis are such as permit the diffusion of the pancreatic ferment into the surrounding tissue.

According to Flexner, the pancreatic secretion may enter the abdominal cavity without causing diffuse inflammation. Woolsey quotes Ceccherelli as saying that extravasation of normal pancreatic secretion into the peritoneal cavity never causes peritonitis.

*Glycosuria.*—Robson says Körte found glycosuria in two out of forty-one cases of hæmorrhagic and in three out of forty cases of gangrenous pancreatitis. In his own experience glycosuria is a very rare phenomenon. It occurs only when there is great destruction of tissue as in extensive cirrhosis or malignant disease. Fat and indigested muscle fibers in stools is more common; lipuria is not as common. These conditions occur too seldom to be of much use in diagnosis, but when they do occur they are of great importance. According to Dieckhoff, an analysis of fifty-three cases of pancreatic disease in which diabetes occurred, showed that 10 per cent of them were due to pancreatitis.

The following cases were chosen from the available cases,

most of which have been reported within the last few years. Only those were chosen in which the etiology was stated or in which it was possible to point out the probable cause. No attempt has been made to pick out any particular class of cases.

### Cases in which Gall-Stones were Present, or Believed to be Present.

In this series there are forty-four cases. In three the stone was in or near the ampulla of Vater, and may possibly have caused the retrojection of bile into the pancreas. Opie has demonstrated how a stone in the ampulla may cause retrojection of bile, and Halsted has shown the necessary conditions in order that this may take place. Flexner has, in a recent article, published experimental results, proving that the bile salts are the agents by which an acute pancreatitis is set up; the nucleo-albumin of the bile, a colloidal substance, has a restraining action on these salts.

*Associated infections.*—The most common organism associated with gall-stones in this series was *B. coli communis.* It was present alone in one case. It was associated with *S. pyogenes* and *M. pyogenes aureus* in one case. In the latter, *B. coli communis* was found in the liver and kidney; the two others were found in the peritoneal cavity. In another it was associated with the *B. lactis ærogenes* and *B. proteus vulgaris,* the three being present in and around the pancreas. In two other cases bacteria were present but not identified. In one a short bacillus was found in the duct of Wirsung. In the other bacteria were found in the mass at the location of the pancreas. In one case the gas bacillus was probably present.

*Strangulated hernia.*—One patient had a strangulated inguinal hernia. The onset was with severe pain in the lower part of the abdomen. It is difficult to say whether the pancreatitis in this case was due to gall-stones or the gastro-intestinal disorder following the strangulation.

*Abnormalities.*—In New's case gall-stones were present but the duct of Wirsung had a separate opening. Although it would be impossible for bile to be forced back an inflammatory process might spread either from the gall-ducts or from the intestines. The patient suffered from nausea and vomiting and was indisposed before the onset of the severe pain indicating pancreatic involvement, she had also suffered from constipation. These points would indicate gastro-intestinal disorder of some kind which, in connection with the general jaundice present, makes it possible that the infection was from the intestines in this case.

In Polkoff's patient the history pointed to gall-stones and was associated with glycosuria. In a case reported by Pearce the duodenal papilla, common duct, and pancreatic duct were dilated, making it very probable that a gall-stone had been present. A marked alcoholic history and duodenitis were also present in this case. Two other cases had had typhoid fever, were over 40 years of age, and both were women. In the remaining no predisposing factor to gall-stones can be pointed out. The cases reported by Trafoyer and Chiari are of special interest for the reason that the pancreas was passed per rectum in both patients.

### Pancreatitis Due to Other Causes than Gall-Stones.

In looking over the reported cases of acute pancreatitis one is at once impressed with the fact that in a considerable number of cases gall-stones cannot be found, and therefore one must look for some other etiological factor to explain the disease. It is very difficult without the most painstaking search to say exactly what the cause is in a given case belonging to this group, and sometimes it is impossible. In the first place it is necessary to exclude gall-stones. A very small stone, as, for example, in Opie's first case, may suffice to cause the attack and can be easily overlooked, especially if the intestines are not carefully examined. In one of Thayer's cases the stone was found in the intestines.

In the second place, a careful bacteriological examination made under favorable conditions is necessary. In a considerable number the *B. coli communis* is found in the pancreas. Is this organism the exciting cause or is it a post-mortem invader? A number of very able investigators believe the latter to be true in the majority of cases. Another difficulty is to explain exactly the method of infection. Only a careful, systematic examination at autopsy will be able to show the relative frequency of the different conditions bringing about pancreatitis in this particular group.

A large number of these cases are preceded by gastro-intestinal disorders ranging from a feeling of heaviness to pain and attacks of nausea and vomiting, and in fact, it seems to me, judging from this series, that relatively the most common condition present which can be said to be a causative agent is gastro-duodenitis. This is especially true when the alcoholic cases are included, as it is supposed alcohol predisposes to pancreatitis by causing a gastro-duodenitis.

In this series thirty-two had a preceding history of gastro-intestinal disorder, in which it is possible to point to this as the probable cause.

In Germain and Christian's patient a careful study was made to determine the possible method of infection. The case is unique in that it was an early stage showing inflammation but no hæmorrhage. The authors suggest that the duodenitis was the primary lesion and that the inflammation spread by direct extension through the intestinal wall, or through the ducts.

Summarizing these cases we have the following results:

Total number with preceding or associated gastro-intestinal disturbances, 32 cases.

Gastro-duodenitis due to alcohol or in which there is a history of alcoholism, 17 cases.

Gastro-duodenitis in which there is no history of alcoholism, 15 cases.

Gastro-duodenitis not due to alcohol associated with *B. coli communis,* 1 case.

Alcoholic gastro-duodenitis associated with *B. coli communis*, 1 case.

Gastro-duodenitis not due to alcohol associated with bacterial infection, of indefinite nature, 1 case.

ACUTE PANCREATITIS FOLLOWING OTHER CONDITIONS THAN GALL-STONES AND GASTRO-INTESTINAL DISTURBANCES.

*Appendicitis.*—It is impossible to state definitely the manner of infection in these two cases. It may have been through the circulatory system or by direct extension. In one the intestines were found markedly congested.

*Typhoid fever.*—Chauffard and Revant report a case of typhoid fever from which the patient had practically recovered when he was suddenly seized with a fatal attack of pancreatitis from which he died sixty-six days after the onset.

Moynihan's case was, strictly speaking, of a chronic type. The patient had an attack of typhoid fever about a year and a half before an operation from which he had recovered. Typhoid bacilli were demonstrated in the bile which showed the nature of the pancreatic disturbance. In this case there had been repeated inflammatory disturbances in the pancreas. When the relative frequency with which the parotid gland is involved in typhoid fever is recalled it seems rather strange why the pancreas is no more frequently attacked especially when the ease with which the infection may take place is recalled.

*Mumps.*—Simonin reports ten cases of pancreatitis occurring in 652 cases of mumps treated at the Hospital of Val-de-Grace. It is worthy of notice that in one case the onset was with violent epigastric pains, followed the day after by parotitis. One case was complicated by an epididymitis; three cases by orchitis. All recovered. Simonin says the pancreatitis in these cases was probably of the nature of an œdematous interstitial infiltration of the soft gland tissue, comparable to that seen in the parotid. Zeller reports one case similar to Simonin's series.

*Boils.*—Porter's patient had typhoid fever one year before and suffered with frequent attacks of quinsy, and had been troubled with boils for four or five weeks before present illness, the probable cause being an infection from the boils.

*Malaria.*—According to Ross and Daniells pain was not a notable symptom in this case. That the malarial parasite will cause extensive thrombi in the smaller blood-vessels of the stomach, intestines and elsewhere has been demonstrated by Machiafava and Barker.

*Gastric ulcer.*—One case.

*Duodenal perforation.*—One case.

*Oxalic acid.*—This is really a case of unknown etiology. The patient had taken oxalic acid, but had apparently recovered and left the hospital to return two days later with marked bronchial symptoms. The author, Frederick Taylor, suggests that the oxalic acid poisoning masked the pancreatic disturbances.

*Emboli.*—Two cases, both died. Reported by Kraft.

One of these patients had suffered for some time with heart disease. During the last illness the patient had symptoms of abdominal disorder and at autopsy infarctions in the pancreas were found leading to a condition of acute hæmorrhagic pancreatitis.

*Syphilis*—This case Kraft believes was due to a syphilitic process in the pancreas. The patient used alcohol to excess.

*Bronchitis and cardiac disease.*—This patient never had symptoms of abdominal disturbance. Kraft, in connection with this case, makes the statement that he believes it is possible for an acute pancreatitis to follow a severe disease without manifesting itself in symptoms, just as a parotitis may follow a septicæmia or certain other diseases without producing symptoms.

*Pulmonary tuberculosis.*—One case; reported by Kraft.

*Retrojection of bile from cause unknown.*—The common duct, duct of Wirsung, and pancreas were bile-stained. The patient had for two days before the onset of the disease slight abdominal pain which might have been a duodenitis and a possible cause of the retrojection of bile in view of the absence of gall-stones and pancreatic calculi. In this case on microscopical examination a very small carcinoma was found in the pancreas, but it was believed by Sappington, who reports the case, not to be in any way associated with the pancreatitis.

*Possible trauma.*—Three cases, all recovered. Jones' patient was seized with severe epigastric pain on turning in bed. That pancreatitis will follow very slight injuries is known. Moynihan speaks of an attack following a very slight blow on the abdomen. In this case a pancreatitis of the hæmorrhagic type developed ending in death.

SUMMARY.

| | | | | |
|---|---|---|---|---|
| Acute pancreatitis | following | | gall-stones or suspected gall-stones | 44 |
| " | " | " | gastro-intestinal disturbances | 32 |
| " | " | " | typhoid | 2 |
| " | " | " | or associated with appendicitis | 2 |
| " | " | " | duodenal perforation | 1 |
| " | " | " | drinking of oxalic acid | 1 |
| " | " | " | gastric ulcer | 1 |
| " | " | " | boils | 1 |
| " | " | " | emboli | 2 |
| " | " | " | malaria | 1 |
| " | " | " | syphilis | 1 |
| " | " | " | trauma | 3 |
| " | " | " | bronchitis and heart disease | 1 |
| " | " | " | pulmonary tuberculosis | 1 |
| " | " | " | retrojection of bile from unknown cause | 1 |
| " | " | " | mumps | 11 |

ONSET.—It has been supposed that in cases of acute pancreatitis due to gall-stones that the onset, as a rule, is more sudden than in the cases brought on by other conditions, but in this series the discrepancy is so slight as to make no practical difference. In this series the onset in those due to gall-stones or supposed to be gall-stones, was sudden in forty-one out of forty-four cases. In those preceded by gastro-intestinal disturbances the onset was sudden in twenty-seven

out of thirty-two. Sudden onset was also the rule in most of the cases following miscellaneous causes. It will be seen on looking over the symptoms of onset, how closely they in general correspond to the original description of the onset given by Fitz.

*Mortality.*—Of the forty-four cases associated with gall-stones thirty died. Of the thirty-two associated with gastro-intestinal disturbances seventeen died, a considerably better showing than in the gall-stone cases.

Of the remaining cases following miscellaneous causes one associated with typhoid fever recovered and one died. One appendicitis case recovered and one died. The three cases following traumatism, the eleven cases following mumps, and the one following gastric ulcer recovered. The others died. It should be remembered, however, that in the latter group there are cases that had fatal diseases preceding the pancreatitis.

Sugar was present in the urine in six cases. Three of these were associated with gall-stones, one with retrojection of bile from cause unknown, the fifth was associated with gastro-intestinal disorders, and the sixth with gastric ulcer. Three recovered and two died. In regard to one there is no statement as to recovery. The two that died both were possibly associated with retrojection of bile, in one there was definite evidence of bile in the duct of Wirsung, in the other gall-stones were present, and in addition typhoid fever. Sugar is supposed to be present in the urine in cases of pancreatitis only when there is great destruction of pancreatic tissue. In one case, the islands of Langerhans were unaffected; in another gangrene had set in in certain areas.

*Complications.*—Pneumonia occurred in three cases. Insanity of several years' duration was present in one case, the pancreatitis being the cause of death. Enlargement of the parotid gland was seen in one case. Delirium tremens was present in one case that ended fatally. The delirium had apparently come on shortly before or simultaneously with the pancreatitis. Epididymitis was seen in one case, and orchitis in three of the cases of pancreatitis following mumps. In Sappington's case a small carcinoma was found on microscopical examination.

Fat necrosis was present in nearly all the cases operated on, or seen at autopsy. These necrotic areas were found not only in the abdominal cavity but also on the pericardium and in the subcutaneous fat. Moynihan mentions a case of Hanseman's where bright red spots occurred on the skin over underlying foci of necrosis in the subcutaneous abdominal fat.

Kraft explains the symptoms seen in pancreatitis on the basis of Lennander's findings in regard to the sensibility of the peritoneum. Lennander has shown that the parietal peritoneum is very sensitive, especially the diaphragmatic portion; and that the portion covering the viscera, colon, mesentery, and liver is not as sensitive. Kraft says the pains begin with the hæmorrhage which causes a stretching of the pancreatic capsule and of the retro-peritoneal portion of the peritoneum in the saccus epiploicus. If the stretching remains stationary for some time the peritoneum adapts itself to the pressure and the pain lessens or disappears to recur again with any new hæmorrhage. At times the hæmorrhage extends down along the mesocolon of the ascending and transverse colon; in these cases there will be pain in the right side of the abdomen.

Kraft has endeavored to point out the different routes that a pancreatic inflammation may take in spreading. Most frequently the inflammation spreads over the peritoneum of the saccus epiploicus closing the foramen of Winslow, thus preventing further extension. If the inflammation spreads through the foramen of Winslow it will spread between the transverse colon and the liver, causing tenderness along the curvature. The inflammatory process will spread further along the ascending colon and finally it may enter the larger peritoneal cavity at the cæcum. Only on rare occasions will the inflammatory process follow the same route as the hæmorrhage. If the hæmorrhage has spread down into the mesocolon, ascending tenderness over McBurney's point may be present and cause some confusion in diagnosis.

Doberauer and Guleke have both recently published papers showing that absorbed trypsin is the cause of the marked collapse and death in pancreatitis, especially in the acute form.

I wish to report briefly two cases that have come to my notice. For notes on Case 1 and for the pancreatic specimen I am indebted to Dr. Sams, of Clarion, Ia.

Case 1.—Male, age 36 years. Family history, negative, except for history of tuberculosis in sister. Past history: always well. Present illness.—The patient ate a hearty Christmas dinner; did not feel well for several days following. On January 6, 1906, he became worse. He was seized with colicky pains in epigastrium, became nauseated, was markedly constipated; showed signs of collapse, had some hiccough.

*Examination.*—No tympanites; slight tenderness in epigastric region. Pulse rapid; temperature normal; urine negative. His physician made a diagnosis of acute pancreatitis.

The patient died January 29, thirty-five days after the onset of illness, and twenty-three days after the onset of symptoms pointing to pancreatitis.

*Post-mortem.*—Heart and lungs negative, except for a nodule in the apex of right lung. Left rectus muscle black in color. No peritoneal fluid, no abdominal adhesions; appendix normal; liver enlarged; gall-bladder distended with tarry bile; no stones, common and cystic ducts enlarged and thickened. Stomach and duodenum showed marked evidence of chronic catarrhal inflammation, most marked at pyloric end of stomach.

*Pancreas.*—Head of pancreas considerably enlarged; body and tail not much enlarged. Whole organ is dark in color and in places black. A number of areas of fat necrosis present. On section the cut surfaces present a mottled black and gray color; the greater portion of the organ being dark in color and

in a few places black. The duct of Wirsung is bile stained, the stained portion extending back into the organ about 1 cm.

*Microscopical examination.*—All sections examined showed a great number of hæmorrhagic areas, and considerable necrosis of gland tissue. The sections from the head of the gland showed some connective tissue proliferation. Islands of Langerhans had disappeared in some of the sections, in most of the sections they were intact. A few needle-shaped crystals were seen in preparations made from areas of fat necrosis. Every section examined showed areas of necrosis and inflammation. A few cocci and short bacilli present.

*Anatomical diagnosis.*—Acute hæmorrhagic pancreatitis.

In this case the primary lesion was probably in the stomach and intestines. As there was evidence of bile having been forced back into the pancreas, in view of the absence of gall-stones at autopsy it seems that the ampulla of Vater may have been closed by the gastro-duodenal catarrh present. The infection may have spread from the intestine by any of the routes already mentioned. The thickened biliary ducts and the connective tissue proliferation in the head of the pancreas would indicate that gall-stones may have been present at some time or other.

For notes on Case II, I am indebted to Prof. Jepson and Dr. Burge.

Case II.—Female, age 27 years, married. Admitted to the surgical side of the University Hospital, May 10, 1904. Family history, negative. Past history: The patient has had some stomach trouble for past seven years, otherwise has enjoyed good health. About one year before present illness she had been confined in child-birth. Eight weeks ago (early in January, 1904), she had an attack of typhoid fever. Six weeks after onset severe stomach trouble set in with epigastric pain, nausea, and vomiting; on several occasions blood was seen in vomitus. She grew steadily worse.

*Examination.*—Moderate distention of abdomen with tenderness, especially marked in the epigastric region. A diagnosis of gastric ulcer was made and an exploratory operation was decided on. At the operation, Dr. Jepson found a great amount of pus in the lesser peritoneal cavity, which was evacuated. Patient continued to have a septic fever and later had sugar in the urine and fat in the stools. Her digestion was very poor. Wound closed six weeks after operation. She died eight weeks after the operation, and about four months after the onset of typhoid fever.

*Autopsy.*—(Dr. Burge.) Cicatricial tissue in numerous areas throughout intestine, showing evidence of healing of ulcers in Peyer's patches. Head and body of pancreas completely destroyed, only a small part of tail of pancreas being left. Grayish necrotic material and pus at site of pancreas. No gall-stones in gall-bladder or ducts, liver normal. No other pathological changes found.

*Microscopical examination.*—(Dr. Albert.) Marked necrosis of pancreatic tissue. Very few pancreatic cells left; in these the nuclei failed to stain; the contained protoplasm showed numerous granules. No islands of Langerhans were seen and no extravasated blood was present.

*Anatomical diagnosis.*—Acute suppurative pancreatitis.

In this case, although *B. typhosus* was not isolated from the necrotic material occupying the site of the pancreas the association of pancreatitis with typhoid fever makes the presumption justifiable that it was a case of pancreatitis following typhoid fever.

In five other cases in this series besides those associated directly with typhoid fever there is a previous history of attacks of typhoid fever. No other acute febrile disease occurred so often. Erysipelas and rheumatic fever occurred twice; pneumonia, influenza, malaria and scarlet fever occurred once in separate patients.

The presence of sugar in the urine and of fat in the stools is another point of interest in this case.

*Conclusions.*—1. Gall-stones are probably the most common single cause of pancreatitis. Judging from this series about forty-two per cent of the cases of acute pancreatitis are associated with gall-stones.

2. Gastro-intestinal disorders are the next most common cause of acute pancreatitis. In this series of cases about thirty per cent belong to this group. Seventeen out of thirty-two of this group gave a history of alcoholism. It is very probable that retrojection of bile may be caused by intestinal disorders closing the papilla of Vater.

3. Acute pancreatitis may be caused by many other conditions. Among these we have typhoid fever, tuberculosis, mumps, trauma, syphilis, emboli, appendicitis, malaria, and gastric ulcer.

4. The organism most commonly present is *B. coli communis;* next comes the streptococcus and the staphylococci.

5. Typhoid fever is the most common of the acute febrile diseases present according to the previous histories of these cases of acute pancreatitis. In the present series three were directly associated with typhoid fever alone, and four had suffered from typhoid fever sometime before the onset of acute pancreatitis, and had apparently recovered; another had had typhoid fever and erysipelas. But two out of these eight cases were associated with gall-stones. It should be kept in mind that in this latitude typhoid is the most common continued febrile disease.

In conclusion I wish to express my thanks to Dr. Bloodgood, of Johns Hopkins University, at whose suggestion this work was undertaken, and who has kindly placed at my disposal his own collection of cases. I wish to thank Dr. Jepson, Dr. Albert, and Dr. Burge, of the State University of Iowa, and Dr. Sams, of Clarion, Iowa, for notes on the two cases reported. To Dr. Decker, assistant in pathology, I am indebted in various ways for help in the preparation of this paper.

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# VENA CAVA SUPERIOR RECEIVING TWO UPPER RIGHT PULMONARY VEINS AND OPENING INTO BOTH ATRIA.

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A patient who had died at the Cleveland City Hospital was brought for an autopsy to the Medical College last year. As far as could be learned he had never suffered from his heart. When the post-mortem examination was made the heart was found to present two anomalies, which alone will be described; the rest of the examination showed no other malformations.

The organ is slightly larger than normal, weighing 350 gms., the enlargement being best marked in the right side, although the walls are but little increased in thickness. Both atria seem rather large. The ostium venosum dextrum is wide, measuring 140 mm. in circumference, but the ostium venosum sinistrum is much smaller, measuring but 80 mm. The aorta and arteria pulmonalis seem normal save for atheromatous changes in the former.

On inspecting the heart one's attention is first drawn to the disposition of the vv. pulmonales. On the left side these are two in number, on the right side, however, there are three; of these the inferior opens into the atrium sinistrum high up, close to the v. pulmonalis superior sinistra. The other two veins, vv. pulmonalis superior dextra and media, the latter being very much smaller, open into the v. cava superior, their orifices being less than two mm. apart. The middle pulmonary vein opens at the junction of the vena cava and the atrium.

Upon opening the atrium dextrum, which is capacious and whose musculi pectinati are well developed, nothing abnormal is at first seen. The fossa ovalis is well defined and completely closed in by membrane which is opaque, the valvula Eustachii

Heart Seen from the Left, Below and Behind.

1. Vena pulmonalis inferior sinistra (cut into in forming flap).
2. Arteria pulmonalis.
3. Vena pulmonalis superior sinistra.
4. Aorta ascendens.
5. Vena cava superior.
6. Vena pulmonalis superior dextra.
7. Vena pulmonalis media dextra.
8. Vena pulmonalis inferior dextra (cut into in forming flap).
9. Lower edge defect or upper edge of septum atriorum, just above which can be seen the orifices of the two upper right pulmonary veins on the farther wall of the superior cava.
10. Vena cava inferior.

thick and well developed. The walls of the atrium sinistrum are smooth save for two small folds on its inner wall which may represent the remains of valvulæ foraminis ovalis but which offer no means of communication between the auricles. High up, however, its inner wall is deficient, so that here it connects with the v. cava sup., just where this empties into the atrium dextrum. This defect is limited below by the thick, smooth, deeply concave margin of the septum atriorum; this free edge of the septum blends posteriorly with the wall of the v. cava sup. just below the point of opening of the v. pul. media dext., while its other extremity can be traced on the antero-medial wall of the vessel as far as a point opposite the center of the v. pul. sup. dext. It thus divides the cava into two parts, and as viewed from above, the opening into the atrium sinistrum is slightly larger. This defect has, therefore, no upper limits and the septum atriorum if projected upward would divide the cava almost symmetrically. A line drawn through the v. pul. sup. sin. and the v. pul. media dext. passes several mm. above this free border of the septum. The defect is not readily seen from the atrium dextrum, being situated high up and partly hidden by the crista terminalis, its lower limit being fully 2½ cm. above the fossa ovalis.

In my search through the available literature I have found no similar cases described. Concerning the abnormal emptying of the pulmonary veins I have found little more than a mere enumeration of possibilities, Peacock[1] putting it among the more common venous cardiac anomalies, and Rauber[2] stating it to be very unusual. With very rare exceptions defects of the primary septum are below (Rokitansky[3]) and are usually associated with other malformations. In 62 cases of communication between the atria collected by Deguise in only 17 was it the only abnormality (Vierordt[4]).

Among the cases bearing some resemblance to this are the following:

Peacock.[5] In the museum of St. Thomas Hospital, specimen marked "D. 62 is a preparation of the heart of a child, six years of age, who presented no signs of disease of the heart till she had scarlet fever, 10 weeks before death. An opening, nearly circular in form and six lines in diameter, exists at the upper part of the septum atriorum above the foramen ovale and the latter passage is closed except that a small valvular communication still exists."

Wagstaffe.[6] First case. "On examining the auricular septum after death it was found that a large aperture existed in its upper part, directly below the entrance of the superior vena cava and about an inch in its transverse diameter."

Second case. "An opening nearly circular in form and six lines in diameter exists at the upper part of the septum auricularum, above the foramen ovale, leading as in the previous case directly from one into the other auricle."

Chiari.[7] Heart large, right ventricle enlarged and hypertrophied. In the upper posterior part of the septum atriorum is an opening 15 mm. in diameter. Foramen ovale, open, pea-size; one large and three small right pulmonary veins empty into the right auricle to the right of a line connecting the superior and inferior cava. Abnormal opening of the pulmonary veins is here considered primary, defect secondary, due to excessive amount of blood from both cavæ and right

lung in the right auricle constituting a disturbing factor in the development of the septum.

Hepburn.[8] Three right pulmonary veins open into the superior cava close to the atrium, two into the left atrium, but closely adherent to the wall of the right auricle. Right auricle dilated, foramen ovale closed. "In the septum atriorum an inch above and quite distinct from the upper margin of the fossa ovalis, there was an ovoid foramen forming a communication between the auricles. The short axis of this foramen measured three-eighths of an inch, its long axis was in the line of the superior vena cava, its upper end being close to the posterior margin of the opening into the right auricle, common to the superior vena cava and the upper right pulmonary vein."

Opening of the vena cava inferior (ascendens) into both atria has been recorded by Rokitansky[9] in six cases in conjunction with other defects.

Defects in the lower part of the septum atriorum, near the venous ostia are the most common and readily explained by a reference to their development. (Vierordt,[10] Minot,[11] Kollmann,[12] Hertwig.[13])

The septal defect in this case, or what is rather more descriptive, the opening of the vena cava superior into both atria seems to be due to the development too far to the right of the septum primum (septum superius of His; primäres septum of Rokitansky). So far, indeed, that, instead of passing to the left of the superior cava, it passes directly through the opening of this vessel and encountering here nothing to which it can form attachments a defect must needs result and any tendency toward subsequent closure would be counteracted by the increased amount of blood in the right atrium and indeed in this very locality. Part and parcel of this same defective process would appear the development of the right pulmonary veins. These all empty higher than usual and the upper two farther to the right than normal. It is as if the disturbing factor was in the atrium sinistrum carrying both the septum and the pulmonary veins so far over to the right as to encroach upon the superior cava. That more than the usual amount of the original pulmonary veins on the right side have been taken up into, and become a part of, the wall of the atrium sinistrum in its formation is indicated by their being three in number and not two as is usual, and as is the case on the opposite side, *i. e.*, the process of extension and growth of the atrium sinistrum has progressed far enough to take in and make a part of its walls not only the two right tributaries of the primitive pulmonary vein but in addition the first tributary of one—the upper—of these as well. Thus, in two of the cases quoted above, where the pulmonary veins empty into the superior cava or right auricle they are also increased in number. The development of the septum secundum was apparently undisturbed.

The accompanying illustration shows the condition very well, the heart is represented as viewed from the right, below and behind the atrium sinistrum having been opened.

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## STUDIES IN GENITO-URINARY SURGERY

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# PROCEEDINGS OF SOCIETIES.

## THE JOHNS HOPKINS HOSPITAL MEDICAL SOCIETY.

*October 15, 1906.*

**Excision of the Sigmoid in a Case of Volvulus.** DR. BLOODGOOD.

The case presented by Dr. Bloodgood was an example of chronic volvulus of the sigmoid flexure. The giant sigmoid colon had been resected August 16, 1905, followed by a lateral anastomosis. The patient recovered without complications.

It is of interest clinically because this man, now 65 years of age, has been admitted to the surgical clinic during a period of sixteen and a half years, thirty-one times, for attacks of intestinal obstruction. On the first two occasions laparotomy was performed and the twisted sigmoid restored to its normal condition. On the other occasions the symptoms of obstruction were relieved by the rectal tube. The operation was performed because the attacks were becoming more frequent. The case will be reported in a future Bulletin with illustrations.

*November 5, 1906.*

Dr. Barker in the chair.

**Exhibition of a Case of Cerebral Palsy.** DR. AMBERG.

Child, a male, twenty-two months old, with a history of asphyxiation at birth which lasted some time. The child now shows atnetoid movements of the hands when excited, and similar but less marked ones in the feet. Otherwise the hands are held flexed at the wrist and show a certain degree of spasticity. The patelar reflexes are increased and the child, though twenty-two months of age, cannot stand alone and is backward in speech. The athetoid movements, together with the increased reflexes and the history of asphyxiation at birth, make the diagnosis of cerebral palsy definite.

**The Topography of the Parathyroids.** DR. MACCALLUM.

The exact disposition of the parathyroids is of interest, especially to surgeons. The glands are distinct from the thyroid gland developing from a distinct rudiment and their removal in most animals causes tetany followed by death. The tetany may be cured temporarily by bleeding and giving an infusion or by giving parathyroid extract either intra-venously or intraperitoneally. These symptoms are not produced in the goat, pig, sheep, etc., for the reason that the position of the glands not being known they are seldom removed. Partial extirpation in dogs as a rule gives no tetany. If only one gland be left certain strains may bring on tetany as lactation, etc. Tetany in human beings was long thought to be due to removal of the thyroid gland. There are weighty reasons for the surgeons to maintain the integrity of the parathyroids. Dr. MacCallum has prepared a number of charts made from dissections at autopsies, showing the various positions the parathyroids may assume. It is easy to distinguish between the parathyroid and the thyroid. The parathyroid is small and not elastic like the thyroid but soft and mushy. It is not translucent and is of a chestnut or a yellow ochre color, homogeneous. The glands are about eight mm. long or shorter; two mm. wide; flabby and tongue like. The thyroid blood supply is derived from the superior and inferior thyroid arteries and that of the parathyroids from separate and distinct branches of these arteries, which are often quite long. There is a soft, loose areolar tissue covering the thyroid gland and extending back of the trachea. The parathyroids are found in this loose tissue, four in number in more than half of the cases. The number found depends usually on the carefulness of the search. The most frequent, though not constant, position of the glands is—for the upper ones—along the posterior border of the thyroid where the superior artery enters it. The lower gland lies in a notch of the thyroid along its posterior border. This is by no means constant, the upper one may lie near the lower one; this may be symmetrical. Or the upper may be lower still, and the lower one below the border of the thyroid or attached to the lower pole. In some cases one may be found over the trachea. In one case Dr. Whipple found the thyroid on one side completely atrophied, and the superior and inferior parathyroid lay quite independent of it, loose, as it were, in the tissue. The parathyroid is nearly always loosely attached and can be picked up on the stalk of the vessel. In the ligation of the thyroid arteries the ligature must be placed inside of the parathyroid branch which is, of course, more difficult in a tumor of the thyroid. The tetany caused by the romoval of the glands, Dr. MacCallum has found, can be warded off or stopped by injection of the parathyroid extract or feeding the glands by mouth; those of the ox are used, in which animal two are found as brown masses at the top of the thymus on either side.

*November 19, 1906.*

**Benign and Malignant Cystic Tumors of the Female Breast.** DR. BLOODGOOD.

These cysts vary from the most benign to the most malignant forms of tumors. Not infrequently a differential diagnosis between the benign and malignant neoplasm cannot be made from the clinical history and examination, and the recognition of its exact nature is possible only at the exploratory incision.

A galactocele is due to a dilatation of a duct in the lactating breast. It is a relatively rare tumor. We have observed but one example. The tumor may arise during, or at various intervals after active lactation. The tumor as a rule is somewhat bottle-shaped, with the neck of the bottle towards the nipple. Unless secondarily infected the skin and nipple of the breast remain normal, and the smooth tumor gives the sensation of fluctuation. At the incision there is a distinct cyst wall of connective tissue with a smooth lining; the contents resemble milk. In the majority of cases the remainder of the breast has the appearance of lactation hyper-

trophy, the ducts are usually dilated, and there may be other small galactoceles. Conservative treatment—excision of the cyst only—should be sufficient. I have never observed a malignant tumor to develop in a galactocele.

Cysts in the lactating breast due to chronic pyogenic infection with the formation of a chronic abscess. We have observed one case. In this instance the swelling without any of the signs of inflammation was observed in the upper and outer quadrant, in the fourth month of lactation. When examined four months later, there was a tumor about the size of a fist involving the entire upper and outer quadrant; the nipple and skin were normal, there was no fever; lactation had not been disturbed. The tumor, though smooth and firm, did not have the characteristics on palpation of an encapsulated mass, and did not fluctuate. At the exploratory incision the skin and subcutaneous fat were normal; then the knife passed through breast tissue, the picture of lactation hypertrophy, from which milk exuded; then a narrow zone of condensed breast tissue devoid of milk, then a very narrow zone of the hemorrhagic tissue resembling granulation tissue; the contents were a thin, granular, yellow material, that is, the appearance of pyogenic pus in which the organisms had died and in which the leucocytes had become granular.

*Cancer Cysts in the Lactating Breast.*—There has been observed one case. It did not differ clinically from the previous case, but at the exploratory incision the wall of the cyst was thicker and more distinct, the lining zone was white and granular instead of red, and the contents were a very thick, granular material, due to broken down epithelial cells.

These three observations demonstrate that during lactation a malignant cyst is possible, and it should be differentiated from the galactocele and the chronic pyogenic abscess.

*Simple Cysts.*—This term is employed to describe a cyst with a smooth inner surface and a definitely outlined connective-tissue wall of 1 to 3 mm. in thickness; the contents are never hemorrhagic, it is either a clear or cloudy serous fluid. These cysts may occur clinically as single tumors in women from twenty-eight to seventy years of age. Clinically they are always benign. They are most commonly observed at the menopause between the ages of forty and fifty, and the breast usually shows hypertrophy, which I have called senile parenchymatous hypertrophy (Surgery, Gynecology and Obstetrics, December, 1906, vol. iii, p. 721).

When these tumors are multiple in one or both breasts (a very common occurrence) a clinical diagnosis is not difficult, but when they occur as a single tumor they cannot always be differentiated clinically from the cancer cyst, or the solid carcinoma. Their recognition, at the exploratory incision is not difficult. For details I refer to the above reference.

*Cysts with Intracystic Papillomata.*—In the majority of these cases there is a history of discharge of blood from the nipple, and quite frequently at the examination blood can be expressed. This history or finding may be considered pathognomonic. At the exploratory incision the character of the cyst wall differs very little from the simple cyst; it may be thicker. But within the cyst one can see or feel a papillomatous growth. The presence of blood in such a cyst is not a sign of malignancy. In the experience, however, of this clinic, we have had an equal number of benign and malignant intracystic papillomata. When the evidence of malignancy has not been indicated clinically by retraction of the nipple, adhesions of the skin, or infiltration of the breast around the tumor, one can demonstrate malignancy, if present, by studying the base of the papilloma. In the benign tumor the distinct cyst wall is present beneath the papilloma; in the malignant tumor this wall and the breast tissue beyond are infiltrated and have the appearance of carcinoma.

*The Cancer Cyst in the Non-lactating Breast.*—The true cancer cyst has a distinct cyst wall which may resemble somewhat the wall of a simple cyst or one containing a papilloma. As a rule, however, the wall is thicker, and if carefully studied the naked-eye appearance of carcinoma should be present. The diagnosis, however, can be readily made from the contents of the cyst. In the majority of cases this is hemorrhagic. So far in the experience of this clinic, a cyst containing blood without an intracystic papilloma to explain the hemorrhage, has always been a malignant tumor. When blood is absent the contents are very thick and granular, differing characteristically from the contents of a simple cyst or a galactocele.

One should look out for these tumors, because they frequently present themselves with all the clinical features of a benign growth, and if a surgeon excises them without careful investigation he will be surprised to learn when the wall is studied histologically, that he has treated a malignant tumor of the breast conservatively, and the probabilities are that a secondary complete operation will not accomplish a cure.

*Sarcoma Cysts.*—Solid sarcoma of the breast is a relatively rare tumor, and until recently I had never observed a cyst of the breast due to the degeneration of a sarcoma. Such a specimen was sent to the laboratory by Dr. Pancoast. Clinically it was apparently a benign tumor in a woman over sixty. The contents were chiefly clear fluid, but the wall of the cyst was entirely different from a benign cyst; it was composed of soft, friable, granular tissue, here and there with specks of blood. It proved to be a perithelial angiosarcoma. I have observed a similar case in the scalp, which was diagnosed a wen, and one between the skin and mucous membrane of the cheek, looked upon as a blood cyst. In these two cases the contents were hemorrhagic.

*Dermoid Cysts.*—I have observed five benign and one malignant tumor of this character so situated subcutaneously in the breast that they had all the appearance of a primary breast tumor. In the benign dermoids the wall was thin, easily enucleated, and the contents typical of a dermoid. In the malignant tumor the wall was thick (3 by 5 mm.), not easily separated from the surrounding tissue, and on section it had the appearance of carcinoma. The contents, however, did not differ from that in the benign tumor.

(A number of pictures were shown on the screen illustrating the various types of cysts of the breast.)

**Typhoid Spine.** DR. MACRAE.

The term typhoid spine was introduced by Dr. Gibney, of New York, in 1889, to designate a certain group of cases, the chief points concerning which are as follows: The condition generally comes on in convalescence and not later than three months after the attack. Pain is the most marked feature. There is a distinct tendency to recover. Certain sensory symptoms are present. Gibney considered it an inflammation of the soft parts holding the vertebræ together. Concerning the actual condition, however, there was a difference of opinion, chiefly between two factions.

Gibney declared it to be a definite organic condition, while on the other hand there were those who believed it to be entirely a functional disorder without any organic change. The first view was somewhat at a disadvantage, since the condition was never fatal, there were no autopsy findings to confirm their belief, while in favor of the second view there were several points. First the condition was only one of symptoms; secondly, the patients always got well; suppuration never occurred. This last was one of the strongest arguments against it being an organic change caused by the typhoid organisms, for, as is generally known, typhoid lesions nearly always suppurate.

Later, however, more men becoming interested in the subject, interesting reports of certain changes were made, such as kyphosis, lateral curvature, and signs of local inflammation (there was in no case, however, any report of suppuration); changes in the lower extremities, such as wasting, changes in the reflexes and sensation, all of which are suggestive of organic changes.

It has only been recently, however, that the organic change has been really recognized. Two cases that we have had here had important changes worthy of note. The first case had had typhoid fever about three months before. The condition began with a sudden pain in the back and in a short time he could hardly move; on his admission he could scarcely be touched, so that only an unsatisfactory examination could be made. Physically nothing was found, but the X-ray showed deposits of bone along the spine in the lumbar region. A few days after admission the patient had a relapse; he improved gradually and three months later when discharged he had a little limitation of the spine and the X-ray showed an increase in the bony deposit.

The second case showed very much the same condition on admission as did the other patient. On discharge two of the intervertebral discs and the lateral ligaments showed bony changes. The infection was with a paracolon organism.

Clinically we have nowhere a condition the equal of the neurotic condition seen in typhoid spine. We have a patient progressing favorably; within three or four days he shows a complete transformation to a whining, complaining creature, crying for no particular reason except that he cannot help it. The pain is helped very little by sedatives, morphia is only helpful in large doses, say a half grain, which probably will have to be repeated.

Certain local changes may be seen, such as redness and swelling. In the legs we have changes in the reflexes and sensation, with probable wasting, which speak, however, for an organic change in the spine. There is without doubt in some cases a bony deposit but we cannot say that in all cases we have an organic change.

Turning to spondylitis deformans we find a clinical picture similar to the typhoid spine, the same marked neurotic condition, the same tendency to get well but often with more severe symptoms; in fact a fairly exact parallel can be drawn between the two. In the arthritis deformans all conditions exist from that in which the whole spine is involved to that in which there is very little pain, so in typhoid we may have the different conditions from the severe to the mild.

Since arthritis is rare in typhoid it does not seem that all are arthritis, and since suppuration is so common in periostitis we cannot go further than Gibney, whose description was a change in the ligaments, periostium, and perhaps in the intervertebral discs.

From the findings of the spinal changes and the clinical conditions, as far as we can tell, we have here two parallel conditions. Since we believe the etiology of arthritis deformans to be infectious we have here two organisms that can cause like changes, namely, typhoid and the paracolon bacilli. The influenza bacillus may be the cause also in some instances. Therefore we may believe arthritis deformans to be due to many different organisms.

There is one point, though, that is not clear—why is it that suppuration does not occur in typhoid spine? It is always dangerous to prophecy, but if this view is correct it is most probable that suppuration will be reported.

To review briefly:

1. Bone changes have been demonstrated in typhoid spondylitis.

2. A comparison of typhoid spine with spondylitis deformans shows conditions partially parallel.

3. Evidence favoring the view that arthritis deformans is due to some infectious agent.

In conclusion it is suggested that the name typhoid spondylitis be substituted for the old name of typhoid spine in spite of the fact that it is so firmly fixed.

**A Case of Congenital Cystic Kidney.** DR. GORTER.

*Clinical features.*—On October 23, 1905, Dr. Cole showed the patient before the Medical Society and gave his history, which in brief is as follows: A man, age 41, with a complaint of shortness of breath and a weakness in the lumbar region; the date of the onset is not known; he had had albumen in his urine for eight years. Two years ago his color changed, he became cyanotic, also pigmented over the cheek; there were signs of cardiac weakness.

The abdomen became enlarged but there was no discomfort,

there was more or less ascites; as the ascites decreased a mass could be felt in the left flank. There was also on the right side a tumor-like mass extending downward into the pelvis; this mass could be lifted forward. There were definite symptoms of cystic kidney polyuria, low specific gravity, and as a late symptom, bloody urine, also albumen and casts in the urine. The hæmaturia, Dr. Cole thought, to be due to a rupture of small vessels in the cyst walls. Over the forehead and cheek there was pigment. Diagnosis cardiac weakness, hæmaturia, chronic nephritis, and tumor.

In June, 1906, he first came under the observation of Dr. Gorter. The complaint then was indigestion and general lassitude. The abdominal examination was the same as above, the urine was alkaline and contained hyaline casts. On July 12, 1906, his temperature was 103° and the pulse rapid and weak; there was dyspnœa and precordial pain. A pericardial friction rub developed which gradually decreased as the cardiac dullness increased. The temperature varied between 100° and 103°. Uræmia developed later with delirium and coma, and death followed from œdema of the lungs.

**Autopsy Report.** DR. WHIPPLE.

*Anatomical diagnosis.*—Congenital cystic kidney, extreme arterial sclerosis, organizing pericarditis, broncho pneumonia, congestion and œdema of the dependent parts of the lung, cardiac hypertrophy and dilitation with diffuse fibrous myocarditis, general pigmentation of the skin, marked flattening of the adrenals.

The kidneys filled both flanks completely, forcing the intestines into a small gutter, as it were, between them; together they weighed 5200 grams. They were made up of bunches of cysts of all sizes; many contained fluid, some colloid material, others old blood clots. The pelves were fan-shaped; the ureters normal. The adrenals were flattened between the upper poles of the kidney and the diaphragm. Dr. Cole's theory of the pigmentation was, that it was due to compression of the adrenals, but the microscopic examination showed nothing to account for it, there was fatty degeneration of the cortex, the medulla was normal. It was possible that the pigmentation was due to the same cause as exists in abdominal aneurysm or any large abdominal tumor. The liver weighing 2900 grams, was also cystic, the cysts as a rule having smooth lining, some contained fluid, some a colloid material.

In the kidneys many of the glomerulæ had thickened capsules, there was also a thickening of the tissue between the tubules, many of which contained blood casts and fresh blood.

In the pancreas there were many cysts formed from the duct and lined by cuboidal epithelium.

Section of the liver, kidney, and pancreas were shown under the microscope.

Dr. Whipple also reported another case of congenital cystic kidney in a female child from the Obstetrical Ward who lived but 45 days. The anatomical diagnosis—double cleft palate, anæmia and emaciation, double uterus, double ureters and pelves of kidney, the ovaries and tubes normal. To the naked eye the kidneys were normal but under the microscope they were seen to be full of small cysts from dilated tubules; some of the glomerular capsules were dilated more or less, and some of the capsules had ruptured into neighboring ones; some of the glomerulæ were of a rudimentary type as in congenital syphilis. This is a point in favor of the idea that the cysts are due to a congenital defect rather than a cystic development. The tubules showed casts, the stroma was slightly increased.

*December 3, 1906.*

Meeting of the Johns Hopkins Hospital Medical Society. Dr. Barker in the chair.

**Exhibition of Cases.** DR. HARVEY CUSHING.

CASE I. *Decompressive craniectomy for brain tumor.*—This patient is 61 years of age. He entered the hospital November 12, complaining of headache, of loss of vision, and difficulty of speech. He has enjoyed fairly uniform good health until the past summer, when he began to suffer from headaches. They have been occasionally frontal, occasionally occipital; have been most profound at night and have for some months given him much discomfort, although they have not completely incapacitated him.

On October 9 a sudden accession of symptoms followed some unusual exertion. His headache became worse; there was considerable vertigo, pallor, and nausea. There was no loss of consciousness. When these acute symptoms had subsided it was found that the patient was markedly aphasic. His understanding of spoken language was somewhat affected, though he vocalized normally; he misused words and his speech was greatly confused; his ability to read written language was affected as was also his ability to write or copy.

His headaches persisted and a few weeks later it was found that he had a double choked disc with hæmorrhages. At about this same time some weakness in the right external rectus muscle became apparent and there was considerable diplopia. His vision, too, began to fail, so that objects were dim, and his visual acuity was much reduced. These perimetric charts taken by Dr. Bordley on November 12 show not only that the field of vision had become constricted but that there was a right, lower quadrantal hemianopsia.

On November 13 a decompressive operation was performed according to the subtemporal method which I have described. The bone underlying the temporal muscle was removed and the dura freely incised to the edges of the bone defect. The brain was found to be under considerable tension. You will see that the wound has healed perfectly, leaving an almost imperceptible linear scar, and that the protrusion is so slight that it would hardly be noticed unless attention were called to it.

The operation has accomplished, not only what it was hoped it would accomplish in relieving the patient's subjective discomforts, but it has done more than that. The palsy of the abducens has completely cleared up, showing that it was probably a pressure palsy alone, for the sixth nerve suffers more often and more quickly than any other of the cranial nerves as a result of various conditions of intracranial tension. The choked disc has entirely subsided. These charts taken yesterday, three weeks after the operation, show that the visual fields have increased almost to their normal limits, leaving, however, as before, the quadrantal notch where there is complete absence of vision, evidently due to the destructive lesion. The patient's aphasia, too, has rapidly cleared up. His speech is much improved and he uses words with only an occasional error. He writes plainly

and understandingly, both spontaneously and to dictation, as this specimen of his handwriting will show. He is able to read understandingly even the small print of the daily newspaper.

His headache, gastric disturbances, vertigo, etc., have entirely disappeared. He sleeps soundly, as he has not done for months; eats with appetite, and is rapidly gaining weight and strength.

We have now had about thirty cases of decompression by this method, the majority of them having given immediate relief, and in many cases with as striking a result as is shown in this patient. I have come to believe that every patient should be operated upon in some such way as this as soon as the diagnosis of intracranial tumor has been made. Operation is especially urgent, as others have said, in case a choked disc has appeared, but I do not think that we should even wait for the appearance of a choked disc. Even if the trouble is possibly of a luetic nature I think the operation should be done first and the drug treatment carried out secondarily, because it is often difficult to distinguish between luetic and actual neoplasms, and it can do the luetic no harm and may save time and loss of ground in case the trouble should prove not to be of luetic origin.

In regard to the desirable place for decompression, I am aware that my views disagree with the opinion that has been expressed by some others, namely, that it is wise to decompress over the suspected situation of the tumor. In this patient, for example, we suspect that the trouble is situated somewhere in the postcentral part of the left hemisphere, possibly near the occipital lobe. If the decompression had been carried out in that situation we would have had a large and obtrusive hernia. As it is, the temporal muscle prevents the undue formation of a hernia and yet allows a sufficient protrusion to relieve symptoms. On two occasions I have seen disastrous results from carrying out a decompression according to this advice, namely, to decompress over the tumor. These were cases in which it was thought possible that the tumor might be found and removed. In both cases the tumor was a vascular glio-sarcoma, situated beneath the cortex, and in both cases the removal of the overlying bone and dura, with the relief of tension and the consequent bulging of the brain, led to the rupture of the poorly developed vessels of the tumor and to a great increase in size of the tumor on account of the hæmorrhages which had taken place. For this reason it may perhaps be unwise in certain cases, to decompress, directly over the growth.

Contrary to the opinion held by many, that only those cases of cerebral tumor should be operated upon in which there are localizing symptoms, I feel that the cases which are *most favorable* for operation are those in which there are no localizing symptoms whatsoever. For in these cases it is possible to relieve the underlying symptoms, and inasmuch as the tumor is implicating some silent area of the brain, it may, in case it is a slow growing tumor, continue to enlarge for months or perhaps years without damaging in any way the more important centers. On the other hand, if the growth has already so damaged centers as to enable us by our as yet gross methods of diagnosis to determine its situation, it has incapacitated the patient to such an extent that decompression merely for the relief of subjective symptoms is much less satisfactory than it would be under these other circumstances. Furthermore, operation and removal in such cases of cerebral tumor as indicate their presence by irritative or paralytic symptoms means, usually, a persistence, if not an increase, of these same symptoms.

CASE II. *Gasserion ganglion operation for major neuralgia.*—This old man, 79 years of age, represents my forty-eighth case of ganglion extirpation. Although in years not the oldest patient—for one of the recent operations was conducted on an old gentleman of 89—nevertheless, he represents the type of neuralgic who is old in his physical condition; so old in fact that one hesitates to subject such a patient to a supposedly critical operation.

He has suffered from neuralgia for twelve years, and during that period has undergone six of the so-called minor or peripheral operations, the traces of which you will see by these supra- and infra-orbital scars, which have so drawn upon the eyelids as to lead to a certain amount of ectropion. During the past twelve years these operations have succeeded in giving him about five years of relief; in other words, they have afforded periods of relief averaging only six months. He has, of course, after each operation been apprehensive of the return of pain, which of late had become very severe and which finally involved the entire trigeminal territory. He, furthermore, had been so thoroughly drugged that sedatives and narcotics in large doses were a daily necessity. He is markedly arterio-sclerotic and has a bad heart with a mitral lesion.

His operation, performed two weeks ago, has left what I have heretofore spoken of as an "invisible scar," and I doubt if any one unaware of the nature of the operation, could have found evidence of this procedure other than by the slight pulsation which you doubtless may be able to see in the temporal region.

In this case I have made use of the more recent methods of conducting this difficult operation, for our methods improve as experience is gained. You will see that he is able to raise his eyebrows symmetrically; in other words, the upper division of the facial nerve has been preserved. You will see that there is no flattening whatsoever—nor will there be subsequently—of the face in consequence of the paralysis of the masticatory muscles, because of the careful preservation and closure of temporal muscle, fascia, galea aponeurotica, and other layers of tissue in the temporal region. Furthermore, in my last twenty cases I have not removed the ganglion itself, although the ganglionic part of the operation has been conducted in a way closely similar to that detailed in my original paper describing the approach under the meningeal artery. However, instead of freeing, as used to be done, the first, second, and third divisions, and lifting the ganglion from its bed—the more bloody part of the operation—the liberation is conducted only between the meningeal artery and the third division. Thus, after this posterior portion of the glangion is well freed from the surrounding envelope by means of a specially made dissector introduced behind and under the ganglion, the sensory root is evulsed from the pons just as is done in the operation of total extirpation, and the root is thus tilted forward over the ganglion so that a gap of about 2 cm. is left between ganglionic structure and pons. Were it not for the troublesome bleeding which comes from liberation of the first and second divisions it would be very easy to remove the ganglion. It, however, is left in its position and this saves considerable time in the conduct of the operation.

One can never tell, however, how long a time one of these operations will require. The procedure in this particular case required two hours. In another patient operated upon a few days before

him, only thirty minutes were needed—the shortest period in which I have ever carried out the procedure. In still another patient, operated upon only two days ago, three hours were required, inasmuch as I found a most unusual condition, namely, a ganglion covered by a shell of bone so that it was necessary to chisel through bone before the ganglion could be exposed. This, however, is such a rare anomaly that it need hardly be taken into consideration.

I know of no group of surgical patients in whom operative measures give more satisfaction than these particular cases. It, however, is difficult and specialized work, and it is only due to the observation of the veriest detail, to the constant study of anatomical conditions and to unusual familiarity with the operation that it may be carried through with comparative safety. In my last twenty-five cases there have been no deaths and no complications, and out of the forty-nine cases I have lost only two. Had I been as familiar with the procedure at the time these two fatal cases were operated upon as I am now, I am sure that these two patients would have been saved. The mortality is generally spoken of as ranging in the neighborhood of twenty per cent, and I doubt very much if this mortality will be lowered except in the hands of those who devote themselves particularly to this form of work.

There are many interesting physiological conditions upon which light has been thrown by the study of these recent cases. Dr. Bordley and I have found in all of them a transient choked disc, which further strengthens our view that choked disc is a matter of mechanical rather than toxic origin. We have found that only in those cases (unusual in our recent series) in which there is a temporary pressure palsy of the abducens is there a narrowing of pupil and palpebral nerve evidencing sympathetic palsy. Removal of the ganglion alone and its three divisions does not necessarily lead to narrowing of the pupil, and hence we are led to believe that the sympathetic fibers run with the sixth nerve. There are many other points in regard to physiology of the trigeminus—its motor distribution, its area of anæsthesia, its relation to taste, etc.,—which I would be glad to speak of here but must defer to a subsequent occasion.

There is one physical peculiarity of many of these patients which may be mentioned, namely, their arterio-sclerosis. Sclerotic changes in the vessels of the ganglion have been found and described by some pathologists as the possible cause of the neuralgia. I am inclined to believe that arterio-sclerosis is a result rather than a cause of the pain. Before his operation this old gentleman had a systolic pressure of about 190 which would rise to 250 or over during his paroxysms. I think it possible that these constantly recurring afferent impulses, like hard work or alcohol in excess, may finally lead to changes in the vessels, from their being subjected to the oft repeated unnatural strain over a period of years. Since his freedom from pain, the blood pressure in this old man has averaged about 140.

The main reason for bringing this patient before you is to show how absolutely inconspicuous is the operation when done by our present day methods. Needless to say, it is the only way of permanently relieving these unfortunates from pain and of restoring them to a life of uninterrupted activity.

Case III. *Exploratory craniotomy for Jacksonian epilepsy, originating in the motor area of the lower extremity.*—This patient was shown to the Society three weeks ago by Dr. H. M. Thomas, who went fully into his interesting history. He has had, as you will remember, Jacksonian fits for the past ten years, these fits beginning with a sensory aura followed by motor twitching in the left leg. For the past six years the attacks have become frequent and many of them are associated with unconsciousness.

Early in 1903 he suffered for some months with headaches and at that time his vision began to fail. He has been under Dr. Thomas' observation for the past year and a half, and an exploratory operation has been postponed, owing to the fact that Dr. Thomas regarded many of his more serious symptoms as quiescent. The examination of the eyes has shown a narrow visual field with a stationary degree of double optic atrophy, and the conditions make it seem probable that this atrophy has been consequent upon a choked disc. It would seem likely that the patient has a tumor involving the superior limit of the paracentral convolutions but which has ceased to give pressure symptoms and only leads to these Jacksonian attacks through some form of irritation. Knowing that in this particular field the upper portion of the motor strip underlies the lateral expansions of the longitudinal sinus, Dr. Thomas did not feel that he could advise an operation very strongly, nor did I undertake it without some misgivings.

On November 22, under ether anæsthesia, a large bone flap was turned down in such a way as to expose the upper areas of the primary, motor, and sensory fields, and the adjoining part of the right hemisphere. The patient took his anæsthesia badly and, although I do not believe in the wisdom of a two-stage operation as a routine for brain tumors, it seemed, in this case, unwise to proceed; the opening of the dura consequently was left for a second stage. The bone flap was replaced; the wound in the scalp was closed. I had some hesitation in tightly closing the wound, inasmuch as there was some oozing from the dura corresponding with the exposed lateral expansion of the sinus, namely, where Pacchionian granulations projected into the sinus and where there were communications between the sinus and the overlying diploe, which communications had been torn when the bone flap was elevated. It was hoped, nevertheless, that the pressure of the flap would be sufficient to stop this slight oozing.

Realizing, however, that the oozing might continue, a blood-pressure apparatus was in continual use during the rest of the day and night, and the patient's pulse was recorded frequently. I saw him four hours after the operation. He was then conscious, comfortable, feeling in no way upset by the procedure.

He passed a very comfortable night and not until the early morning hours was there evidence that anything was going wrong. At 5 a. m. his pulse, which had been about normal, dropped to the 60's, and two hours later it registered as low as 54. He had become somewhat drowsy.

When I saw him at 9 o'clock in the morning it was a little difficult to arouse him, though when aroused he said that he felt comfortable and felt no pain. His pulse was slow, his blood-pressure had begun to rise, and there were, even on palpation, distinct rhythmic waves in the tension of the pulse, waves not only in its tension but in its rate, and these waves were likewise accompanied by perceptible alterations in the depth of his respiration. At the same time an ophthalmoscopic examination showed a high grade of choked disc; even on top of his atrophic nerves the œdema was so great that it measured 4 diopters. It is to be remembered that before the operation there

was no œdema whatsoever of the retinæ. Dr. Eyster, whose observations have done so much to throw light on the physiology of Cheyne-Stokes respiration, made at this time some careful charts, which I hope he will demonstrate to you, for they show definitely the rhythmicity of pulse-rate, blood-pressure, and respiration.

It was quite evident that the patient was approaching Kocher's *Höhestadium des Hirndruckes*, and preparations were made to reopen the wound. This procedure, however, was unavoidably delayed, and not until 12 o'clock of that day, eight hours after the first onset of symptoms, were we able to determine, on opening the wound, what it was that had caused the pressure symptoms. The dressing was removed, the sutures holding the anterior edge of the incision were divided, and no sooner was this done than the bone flap dislocated itself outward and a large, black, extradural clot, fully 3 cm. in thickness, began to ooze from the wound. The patient, who by this time had become so profoundly unconscious that he failed to respond to stimuli, immediately turned his head over, opened his eyes, and said, "Why, good morning." Though all of this proved very spectacular, the real reason for recording this case is to show the importance of careful observation, on physiological grounds, of patients in whom there is any postoperative likelihood of complications from intracranial hæmorrhage. The clot was scraped away and the partially reopened wound filled with iodoform gauze, and the patient returned to his bed. He had no further symptoms of compression and the œdema of his eye grounds rapidly subsided.

On November 27, five days ago, the second stage of his operation was performed; the dura was opened, and although the usual difficulty was experienced in exposing the leg centers, we finally succeeded in getting a clean, dry exposure, and no cortical evidence whatsoever of a tumor was found. The exposed cortex was faradized and in this patient for the first time I succeeded in eliciting clean-cut movements from thigh, lower leg, and foot. It is unusual to have this inaccessible edge of the hemisphere so freely exposed as to allow of cortical stimulation. The dura was then closed, the bone flap replaced, and the scalp once more resutured. You will see that, despite this second closure and the six days of partial opening of the wound, the healing has been almost as perfect as it is in the general run of these cases which have been permanently closed at the first sitting.

The case is chiefly interesting from its physiological side, demonstrating as it does the early phenomena of compression, their timely recognition, and their immediate subsidence after removing the source of pressure. From a therapeutic point of view we have accomplished nothing. However, it may be said that in case one can accomplish nothing, the next most desirable thing is to do no harm, and I am glad to say that in this poor fellow's case we have gotten out of our operative difficulty without damaging him. As is usual in these exploratory operations for epilepsy, even when nothing is found, he expresses some subjective sense of betterment and as yet has had no return of the mild type of his epileptiform seizures. I do not, however, anticipate that this apparent benefit will be of any considerable duration and there is no reason to believe that his attacks will not continue as before.

If our focal diagnosis has been correct, either the growth is a subcortical one, or else it lies on the mesial surface. At all events it is certainly inactive at present and for three years has not led to any increase of tension sufficient to give pressure symptoms; nor did we find any evidence of increased tension at the time of operation.

**Cases of Thrombosis of the Posterior Cerebral Artery.** Dr. Thomas.

Two years ago Dr. Thomas showed a patient with thrombosis of the posterior cerebellar artery, and last summer a patient died in the hospital of the same trouble. The picture presented is one of a remarkable combination of symptoms; Dr. Thomas has collected twenty-five cases corresponding to this picture. Among these there have been seven autopsies reported, besides those of Dr. Thomas. A microscopic examination shows a softening in the mid-olivary region, and a thrombosis of the posterior inferior cerebellar artery has either been found, or assumed. Dr. Thomas called attention to Mr. Burrows' work done in Dr. Mall's laboratory, on the anatomical distribution of this artery. The disease occurs usually in men somewhat above middle age, with a sudden attack of vertigo, and rarely loss of consciousness. There is a tendency to fall in one direction and a pain on the same side of the face towards which they tend to fall; and a difficulty in speech and swallowing, accompanied at times with persistent singultus. The initial symptoms last for a shorter or longer period, some of the patients being in bed for a year on account of the vertigo. On examination an interesting picture is found: if the patient sits up or stands he tends to fall to one side always. The visable perspiration is on the side opposite to that towards which he falls; he is apt to have a difficulty of speech from paralysis of the vocal cord on the side toward which he falls; there is also a certain amount of ataxia in the limbs on this side and a slight ptosis with contraction of the pupil.

Sensory examination shows on the affected side a loss of pain and temperature on the face and the same loss on the contra-lateral arm, body, and leg.

The history of the man who came into the hospital this summer and died is as follows: He was somewhat of a nervous or hysterical temperament. Six weeks before admission he had an attack of vomiting, three weeks later he had an unconscious attack, was unable to swallow or speak and the pupil was smaller on one side with a ptosis on that side also. On examination there was found a marked arterial sclerosis and the patient was somewhat out of his head. There was thrombosis of the vessels of one leg, the lungs, heart, and kidneys were involved; temperature was 100°. Sweating was apparent only on one side, on the opposite side ptosis and a small pupil, and a loss of pain and temperature in the distribution of the V, was present. At autopsy there was found a thrombosis nearly everywhere, but no thrombosis was evident in the posterior cerebellar artery as was expected. However, on microscopic examination, this artery was found completely thrombosed, and a softening of the lateral aspect of the medulla in the region just outside of the olive.

Among the interesting points to be explained is the crossed dissociated sensory distribution. This is believed to be due

to involvement of the descending root of the V, and Gower's bundle, conducting pain and temperature from the opposite side of the body. The ataxia, and the falling to one side, are due to involvement of tracts which reach the cerebellum by the restiform body. The slight ptosis, the small pupil, and the lack of sweating are due to the involvement of the sympathetic tract in the medulla. Just where the tract is, is not known.

**Some Observations on the Action of Lipase.** DR. LOEVENHART, G. PEIRCE, and C. G. SOUDER.

Six years ago Dr. Kastle and Dr. Loevenhart demonstrated that lipase is reversible in its action on ethylbutyrate; that is, it is capable of forming the ester from ethyl alcohol and butyric acid, as well as effecting its decomposition into these substances. Lipase accelerates the reaction in either direction. Later Dr. Loevenhart demonstrated lipase in greater or less activity in most of the tissues tested. This work suggested a simple explanation of the fat absorption from the intestine, its translocation and deposition in the tissues and its utilization during inanition. Later lipase was shown by Hanriot to be reversible in its action on monobutyrin and others have demonstrated synthesis of triolein by the action of lipase. Up to the present work no extended study has been made to determine whether the hydrolysis of different esters by different tissues is always due to some enzyme. During this work of Loevenhart, Souder, and Peirce two interesting problems arose, namely: (1) The effect of bile upon the hydrolysis of esters by pancreatic juice; (2) the action of sodium fluoride on the hydrolysis of the various esters. The general view of the function of the bile in the absorption of fat from the intestine has been that it dissolves the fatty acids formed and emulsifies the fats and that its action is therefore simply physical. The solvent and emulsifying action has been attributed to the bile salts. Hewlett, last year in the J. H. H. BULLETIN, made the observation that bile accelerates the hydrolysis of the water-soluble ester, triacetin by pancreatic juice, twenty-six times, while pancreatic juice alone has comparatively little action on it. The action of the bile in this case could not be attributed to its emulsifying and solvent action. Hewlett believed the acceleration to be due to the lecithin contained in the bile.

Loevenhart, Souder, and Peirce have studied the effect of bile salts, lecithin and bile on the hydrolysis of a series of esters by pancreatic juice. Their results are in brief: (1) These mixtures all accelerate greatly the action of pancreatic juice on all of the esters studied. (2) The effects of these substances, especially the bile salts, vary enormously with the concentrations employed. Thus the amount required to accelerate the action on triacetin has practically no effect on the hydrolysis of olive oil and the quantity required to accelerate the action on olive oil greatly inhibits the action on triacetin. (3) The accelerating effect on the hydrolysis of one ester is no index of its effect on another ester. (4) The accelerations noted with lecithin and bile salts vary with different specimens of juice; in some cases the former, in others the latter causes the greater acceleration. They believe that it is chiefly the bile salts that cause the accelerating action of the bile, under physiological conditions, and agree with Hewlett that their action is not altogether due to their solvent and emulsifying action.

They offer no explanation of the mechanism of the acceleration noted in the hydrolysis of esters when the pancreatic juice is mixed with bile salts, lecithin, or bile.

As to the action of sodium fluoride on the hydrolysis of the various esters, Kastle and Loevenhart found sodium fluoride, 1-5000, greatly inhibits the hydrolysis of ethyl acetate and ethyl butyrate by the liver and pancreas extracts. The idea in this work was to determine whether it retards the hydrolysis of the higher fats as well as that of the lower esters. All of these processes are retarded by the fluoride, but the concentration of fluoride required varied enormously with different esters. The acid from which the ester is derived determines the inhibiting effect of the fluoride.

The inhibiting action of the fluoride decreases with increasing molecular weight of the acid from which the ester is derived. Thus hydrolysis of the esters of acetic acid is about 15 times as sensitive to the fluoride as that of ethyl butyrate, and the hydrolysis of ethyl butyrate 100 to 1000 times as sensitive as that of olive oil.

The hydrolysis of the lower esters is remarkably sensitive to the fluoride. Even in concentrations of 1 to 100,000,000 some inhibition is noted. When dilutions beyond the limits of inhibition were used acceleration was frequently noted. Similar facts have been observed in many other enzyme processes.

It was found that the ratio between the activity of the liver and the pancreatic extracts, when tried on different esters, was far from constant. In fact it decreased in an orderly way with the increasing molecular weight of the acid from which the ester is derived. With ethyl acetate the liver was found, in one case, to be about eleven times as active as the pancreas, while with olive oil it was about one-seventh as active as the pancreas. This indicates that the ester-splitting enzymes of the liver and pancreas are different. However, the liver does not contain a specific inhibitor nor the pancreas a specific accelerator for the hydrolysis of the higher fats, as was at first suggested. This was proved by studying the action of a mixture of liver and pancreatic extracts on ethyl butyrate and olive oil.

It was also found that the pancreas of different individuals of the same species varies in its relative activity towards two esters, and much larger variations are noted when different species were studied. These variations are believed to be due to variations in the substances mixed with the enzyme. The same is true of the livers of different species.

It must be borne in mind in considering the identity of different enzymes that, in all the enzymic preparations hitherto obtained we have, in addition to the catylitic substance or mixture of substances, *i. e.*, the enzyme, an unknown quantity

and number of admixtures, the effect of which must, for the present, remain unknown. This admixture is often of the greatest importance. Thus the work of Magnus and the writers has shown that, in addition to the enzyme, the bile salts are essential in the hydrolysis of amyl salicylate by liver extract. The physiologist may look upon the bile salts as an essential part of the enzyme which hydrolizes amyl salicylate.

Some acid is also essential in the hydrolysis of proteids by pepsin. It is suggested that the bile salts and the acid, which can readily be separated from the enzymic preparations should be called coferments. All of the hydrolytic enzymes at present known are destroyed by heat, are non-dialysable, and are catalytic in their action, as far as this has been studied. It is to such a mixture of substances that the term enzyme should be restricted at present, and the term coferment can designate those substances which fail to have any of the above properties, but which are essential to the action of the above group.

DISCUSSION.

DR. BARKER.—I think it is fortunate for us that studies of this kind are being carried on at this medical school. We used to think that the methods of bacteriology were delicate, but evidently they are gross and crude contrasted with the fineness of some of the modern chemical methods. I am interested in hearing Dr. Loevenhart say that he regards the lipase of the liver as distinct from that of the pancreas. The recent work of Magnus indicates that the lipase of the intestinal juice and that of the gastric juice are also different from pancreatic lipase, inasmuch as the latter has its activity greatly increased by glycocholate and taurocholate of soda (synthetic), while the former do not.

I should like to ask Dr. Loevenhart if he has tested the relation of the action of sodium fluoride in connection with the splitting of bodies stereochemically allied to lipase. From some recent work done by Otto Warburg it would seem that lipase itself is less sensitive to stereochemical influence than is the protolytic pancreatin, for while pancreatin acting upon inactive leucinester splits only one of the components, giving rise to l-leucin, leaving the d-leucin-ester unsplit, whereas lipase splits some of both esters, it would be interesting to know whether the effect of sodium fluoride on the action of lipase is more sensitive to stereochemical influence than the lipase itself.

# NOTES ON NEW BOOKS.

*Tumors, Innocent and Malignant.* By J. BLAND-SUTTON, F. R. C. S. Fourth edition. (*Chicago: W. T. Keener & Co.*)

The demand for a fourth edition speaks well for the popularity of this well-known volume.

The present edition contains over a hundred more pages than the previous one, and numerous new illustrations. There is also a different arrangement of chapters and the main groups of tumors have been somewhat revised and added to, the author arranging them as follows: Group (1) connective-tissue tumors, (2) tumor diseases of the teeth—odontomata and dental cysts, (3) epithelial tumors, (4) tumors arising from the chorionic villi, (5) teratomata and dermoids, (6) cysts.

The chapter on gliomata seems rather brief considering the interest recently shown in regard to this group of tumors. The chapter on sarcomata of bone is even more fully considered than it was in the excellent chapter in the previous edition. The section dealing with neuromata and allied conditions of the nervous system is of particular interest.

Numerous passages on the homology of tumors and other examples of vicious development in lower animals are interesting and suggestive.

The section on carcinoma of the breast, though given more space than in the previous edition, is still not as complete as the importance of the subject demands.

The illustrations are numerous and good, those showing the gross appearance being superior in general to those of the microscopic structure.

The lists of references at the end of the chapters is more extensive than in the previous editions and the index is well arranged.

*American Practice of Surgery, a Complete System of the Science and Art of Surgery, by Representative Surgeons of the United States and Canada.* In eight volumes. Edited by JOSEPH D. BRYANT, M. D., and ALBERT H. BUCK, M. D., of New York City. Volume I. (*New York: William Wood & Co., 1906.*)

According to the preface this work is intended to portray surgery as practiced to-day in the United States and Canada, and to this end, at the risk of much repetition, numerous surgeons of note, scattered over a wide territory, have been asked to contribute to it.

The first volume of this System of Surgery, which bids fair to be a very extensive and voluminous one, is a large, unwieldy tome of 797 pages. Among the contributors to it are Warthin of Ann Arbor, who writes on "Inflammation"; Galord of Buffalo, who writes a chapter on the "Parasitical Relations of Cancer"; Bloodgood of Baltimore, who contributes an article on "Surgical Shock"; Bryant of New York, who writes on "General Surgical Diagnosis"; Dodd and Osgood of Boston, who describe the "Technique of Radiographic Work"; and several others.

The introductory chapter by Stephen Smith on "The Evolution of American Surgery" is quite interesting. The contribution of Dodd and Osgood, which is illustrated by numerous beautiful radiograms is very instructive and well worth reading.

I can hardly see the place which such a surgery will fill. It is too extensive for the ordinary student body and, being almost devoid of references to the literature, will not appeal to more advanced students. W.

Volume II of the above system compares favorably in general interest with the first; Gibney, Pilcher, Tilton, Willard, and others have contributed articles. It is, like the first, divided into five parts, including tuberculosis and syphilis, surgical diseases of various structures of the body, simple and complicated wounds, diseases caused by heat, cold, and the electric current, and a chapter on skin diseases in their relation to surgery. It is copiously illustrated and has a good index. R. N.

*Syllabus of Lectures on Human Embryology.* By WALTER P. MANTON, M. D. Third edition. (*Philadelphia: F. A. Davis & Co., 1906.*)

*Outlines of Human Embryology.* By GEORGE REESE SATTERLEE, M. A., M. D. (*London: John Wiley & Sons, Chapman & Hall, 1906.*)

When requested several years ago, to review Manton's Syllabus of Lectures on Human Embryology, introductory to the study of Obstetrics and Gynæcology, the book seemed so evidently trivial as to be unworthy of any serious attention. The present review has then been undertaken quite reluctantly.

The book is of small size, comprising about 125 pages, of less than 200 words each. Twenty-five of these pages are devoted to the anatomy of the adult male and female organs, 16 to the chapter headed "Practical Work," 8 to a glossary of terms, and only about 65 to embryology, though an attempt is made to summarize this entire field.

In glancing through the pages, a considerable number of words, found in the glossary for the most part, are seen to stand out in the text in black-faced type or italics. The text more carefully examined, is found to be a sketchy outline of the most conspicuous features of development, bringing in most common terms, yet limiting strictly the information to be gained. The illustrations strengthen this impression. It will be sufficient to refer to the frontispiece of the new edition to indicate our meaning. The section "Practical Work" is equally unsatisfactory, lacking in necessary details, and could hardly be called helpful. Another edition of this work has just appeared and the reviewer is again disappointed at the impossibility of finding anything praiseworthy or worthwhile in it. The original lectures of which the book is a syllabus may be most illuminating, and the book may possibly be useful to the author's own students, but it is difficult to see what further purpose its publication can serve.

Since, however, another author, Dr. Geo. R. Satterlee, has seen fit to issue a similar work and since medical students are so frequently unable to estimate the value of treatises on embryology, or indeed to realize the importance of this fundamental branch of anatomy, we feel obliged to protest against such methods of belittling and condemning a really fascinating subject.

Satterlee's outlines ("A Medical Student's Hand-Book of Embryology") permit more embryology, since 160 pages are entirely devoted to this field, though the matter is not much more extensive than that on Manton's pages. The illustrations are for the most part to be found in McMurrich's "Development of the Human Body"; they are generally much schematized and quite inadequate, the half-tones from the author's photographs adding nothing to the value of the illustrations while they increase the price of the book.

The difficult and fascinating problems of maturation, fertilization, segmentation, and the early formation of the germ-layers are sketched in a very schematic manner within 15 pages, much of which is devoted to pictures and to comparative references to the conditions of development in the lower animals, which would require much more space to be intelligible to a beginner. The chapter which includes the formation of the membranes would be especially unsatisfactory to medical students.

There is no space here for a consideration of each separate chapter of this little book. The subjects are treated in the following manner:

The Alimentary Canal and its Derivatives, 14 pages; Muscles, Extremities, and Skin, 12 pages; Muscular System, 23 pages; Genito-Urinary System, 16 pages; Nervous System, 24 pages; Special Senses, 17 pages; and Glossary, 14 pages. When the small size of the page and the relatively large size and leading of the type and illustrations are taken into consideration, this is certainly a minimal allowance for the treatment, even in outline, of the complicated embryological processes which are discussed.

Such an outline would require special genius for concise and at the same time comprehensive statement to be satisfactory. We regret to say that this book fails to exhibit such characteristics.

It is only within a comparatively recent period that medical students in this country have been expected to be acquainted with embryology and even now the subject receives anything but adequate attention in the medical curriculum. This is not generally true, of course, of the University Medical Schools where some knowledge of comparative embryology is required on entrance, and special study is afterward made of the development of the human body.

Students who have had the advantage of college training in biology, zoölogy, and the embryology of the lower forms will not be attracted to such books as the two here considered. There are, unfortunately, however, a large number of well-meaning medical students who might be induced to spend their money and time on such reading matter, in an honest effort to make up for the deficiencies of their training. We regret to be obliged to say to them that it will be impossible for them to secure, in this way, any adequate conception, or even a glimpse of the facts or problems of the development of the body.

This review is not written to criticise the details of description in these small text-books, nor to find fault with the authors. We feel compelled to protest vigorously, but rather at conditions than individuals.

It seems little short of presumptuous that anyone should deliberately proceed to make this aspect of anatomical science, which has received so many brilliant and capable contributions in this country, ridiculous by attempting to reduce it to such so-called "outlines." How is the student to gain the impression that embryology covers an extensive field full of vital problems and teems with suggestions to aid us in interpreting the form of man? He can here form no conception of the vast amount of work that has been done in this field, nor of the activity that is so evident among the workers of this country. Books of this character belittle the whole subject to such an extent that it seems to be little more than a catalogue of terms. The entire science is thus made to appear capable of being memorized in an evening.

When we find this work done by instructors in our medical schools, we naturally inquire how it was possible for these authors to lose sight of the opportunity to elevate their science and broaden the views of their students, and we are forced to lay the blame at the doors of the institutions where they teach and whose methods have apparently influenced them.

There are still a large number of medical schools which continue to place anatomy on a plane somewhere below practical surgery or medicine and pathology. Admitting its usefulness to these branches they foster its development, however, only in so far as the practical physician dictates, not as an independent science. This attitude has been so general as to be seldom criticised except by a few anatomists, and then at the risk of a snub.

In no other department of science are experts and investigators so constantly dictated to, as to how and what to teach, by others whose work has only a secondary relation to theirs. The surgeon or "practical" physician does not hesitate to dogmatize on how much dissecting, lecturing, quizzing, osteology, neurology, or embryology should be taught by the professor of anatomy.

This generally results in Anatomy, where each course is limited to the demand made by the practitioners. Often there is no real department of anatomy under a scientifically trained man who is devoting all of his time to furthering the development of his science. The obstetrician teaches embryology; the biologists or

pathologists teaches histology and perhaps neurology, if this is not handed over to a clinician; gross anatomy is a lecture course with some demonstrations, or a quiz course in close reference to immediate clinical needs.

Since these are certainly very common conditions under which embryology is taught, is it surprising that its contents may be regarded by many students, and even teachers, as after all of little significance? If such influences are brought to bear on a teacher who has not studied embryology first-hand and from a broad morphological standpoint, it would be remarkable should he produce a more adequate work on embryology. Indeed, he is to be praised for having avoided the pitfalls of verbosity.

H. McE. KNOWER.

*The Vermiform Appendix and its Diseases.* By HOWARD A. KELLY, A. B., M. D., Professor of Gynecology in the Johns Hopkins University, and E. HURDON, M. D., Assistant in Gynecology in the Johns Hopkins University, Baltimore. With 399 original illustrations, some in color, and 3 lithographic plates. (*Philadelphia and London: W. B. Saunders Company, 1905.*)

In the first section the history of appendicitis is traced through successive stages from the discovery of the lesion in 1759 by Mestivier, to the remarkable work of Fitz in 1886, in which he cleared up the entire subject, both as to diagnosis and treatment.

Then follows an outline of the development of operative technic up to the present time, and the important facts in this very interesting description are emphasized in many places by quotations from the original articles, with brief discussion.

The anatomy of the organ, gross and microscopic, including embryology and comparative anatomy, is carefully considered in a section replete with elaborate and realistic illustrations which do great credit to Mr. Broedel and his associates, and these splendid plates are continued throughout the book, aiding materially the descriptive text.

The chapter on traumatic appendicitis is of interest for the reason that appendicitis is now recognized as being caused by injury much more frequently than formerly.

Attention is called to the fact that "evidence is lacking to show that trauma has caused appendicitis in a previously sound appendix; the presence of a concretion; old adhesions; flexion on itself; cystic condition; unusual shortness and width; being considered as deviations from the normal."

The authors say "one must also bear in mind that the injury need not necessarily be of recent date, although some symptoms, it may be of a vague character, will probably be recalled as immediately following it."

In the other sections the appendix is taken up from every standpoint in a most comprehensive manner, and each chapter covers its subject thoroughly.

The volume is without doubt the most complete and up-to-date work on the appendix and its diseases, and will be welcomed by all physicians and students interested in this important subject, and be of great use to operating surgeons.

*Burdett's Hospitals and Charities, 1907.* The Year-Book of Philanthropy and Hospital Annual. 18th year. (*London: The Scientific Press, Limited.*)

The value of this publication is recognized by all hospital superintendents and many others interested in philanthropic works, and with each year its importance grows. It is one of the few serials that it is absolutely necessary to students of this branch of social economics. Though it deals in large measure with English institutions, yet, as there is no similar publication in America, the information to be obtained from it is invaluable.

R. N.

*Biographic Clinics: Influence of Visual Function upon Health.* By GEORGE M. GOULD, M. D. Vols. IV and V. (*Philadelphia: P. Blakiston's Son & Co., 1907.*)

Whether or not the reader agrees with the views propounded by Dr. Gould that many of the minor (?) ills of man are due to disturbances of vision, and that by wearing glasses these ills are cured, and the patient changes from a neurasthenic to a happy, cheerful person, none the less the essays in these two volumes are worth reading. Whatever the cause of the suffering in the men depicted by Dr. Gould may have been, such psychological studies as he has made are interesting, and a closer study of similar morbid conditions, so carefully described by this author, will help any doctor to a better understanding of his patient, and so to a more rational treatment than usually follows a hasty diagnosis of neurasthenia. This is but giving a name to a complex association of symptoms and does not disclose the cause, to which alone treatment can accurately be directed. Dr. Gould has been much laughed at for his views, but his courage in pronouncing them against the generally narrow views of the medical fraternity, who temporarily at least look askance on all novel ideas, and are as narrowminded and slow as any profession in adopting new theories, has had its good result. He has helped to show that more suffering is due to eye-strain than was previously supposed, and if his enthusiasm has led him to maintain views which do not appear on the whole well based, yet the enthusiasm is to be admired, as it has had but good results, and all must respect Dr. Gould for his industry and learning.

R. N.

*A Manual of the Diseases of Infants and Children.* By JOHN RUHRÄH, M. D., Baltimore, Md. (*Philadelphia and London: W. B. Saunders Company, 1906.*)

The author in this manual has succeeded admirably in accomplishing the task set forth in the preface, namely, to present the more important facts of pediatrics succinctly to the student and to furnish him with a "rapid reference-book for clinical use." The danger in placing a compendium of any medical subject in the hands of the undergraduate is that, in his study of a disease, he will go no further than to glance at the outlines reviewed in the small volume. This temptation is minimized as much as possible, in the present work, by the frequent insertion of references to comprehensive and recent articles on the more important subjects treated. The opening chapters on the anatomic and physiologic peculiarities of infancy and children, the diseases of the new-born, and infant feeding contain important data found in the larger text-books. In another edition the increasing value of sodium citrate in artificial feeding will doubtless receive recognition. The section on the diseases of nutrition is much too brief to convey to the reader the proportionally large rôle these ailments play in pediatrics. The list of affections of the alimentary tract and chest seems quite complete—though some descriptions, as for example, that of lobar pneumonia are unduly abridged even for a work of this character.

The chapters on the diseases of the skin and infectious diseases are particularly satisfactory, because the nature of these ailments and their differential diagnosis favors terse statement. The frequent association of pavor nocturnus with adenoid growths, and possible partial asphyxia, should be mentioned under disorders of sleep.

A useful chapter on therapeutics is appended, in which the various procedures now used in the treatment of sick children, as well as the most acceptable forms of prescribing the few drugs needed, are carefully stated.

Altogether, the book will prove a valuable quick asset to one who wishes to refresh his memory upon almost any subject belonging to pediatrics.

*Human Blood-Vessels.* By ARTHUR V. MEIGS, M. D. (*Philadelphia and London: J. B. Lippincott Co., 1907.*)

The book is devoted entirely to the study of the anatomy and pathology of the human blood-vessels, being practically a profusely illustrated record of the changes in the vessels which the author has encountered. It does not profess to be an exhaustive study of the human blood-vessels nor even to be systematic, but is intended to supply the place of the author's previous book on the origin of disease, all unsold copies of which were burnt.

The illustrations, of which there are one hundred and three, are beautifully executed, several of them being exquisite etchings. They are quite objective and, indeed, this is perhaps as well, for the author is in some cases unable to explain the lesion which is represented. In spite of the enormous literature on the subject of the anatomy and pathology of the vessels the author finds it unnecessary to refer to anything except such authorities as the Century Dictionary and one or two text-books.

The text consists of a rambling discussion of the impressions produced by a number of arteries and veins with but little regard for the general principles laid down by others in similar studies. That such isolated work, carried on away from the critical interest of others may lead to error is illustrated in the discussion on pp. 57 and 66. With reference to Figs. 36, 49, and others, where a very local disease of the vein is described and its possible syphilitic origin disputed, it is evident from the drawing that the section had merely passed through a set of valves in the vein, giving rise to the curious appearance.

Other general theories as to the fibroid invasion of vessel walls and other tissues, to the independent new-form also of blood-vessels in the adult, and the intrinsic causes of chronic disease are hardly in accord with the views of most modern pathologists.

*Scientific Memoirs by Officers of the Medical and Sanitary Departments of the Government of India.* New series. No. 25. *On the Importance of Larval Characters in the Classfication of Mosquitoes.* By CAPTAIN S. R. CHRISTOPHERS, M B., I. M. S. (*Calcutta: Office of the Superintendent of Government Printing, India, 1906.*)

Captain Christophers calls attention to the fact that many writers in describing various genera or species, lay emphasis on characters which are common to all and may scarcely mention the distinctive points peculiar to any given insect.

He describes briefly the features which are common to all larvæ, then in more detail those which are characteristic of many or only a few of the genera. A species of cannibal larva is described which feeds voraciously on younger larvæ and perhaps is a factor in decreasing the number of mosquitoes.

The important variations are found in the forms of ova and their arrangement in rafts—the antennæ, feeding brushes, and papilla of the larvæ, and a few other anatomical structures. The memoir is fully and carefully illustrated. G. H. W.

*No. 26. Leucocytozoön Canis.* By CAPTAIN S. R. CHRISTOPHERS, M. B., I. M. S.

The parasite has been described by James and by Bentley, who studied it in the circulating blood, but its life history in the organs was not investigated. The writer finds the parasite commonly in dogs about Madras—especially in poorly nourished, neglected animals. The mammalian hemogregarines differ from all forms of blood parasites and their appearance in the dog is very striking. The parasite is found in leucocytes and consists of an oblong, nucleated unpigmented body contained in a capsule or cytocyst, which is probably formed from the substance of the leucocyte. This capsule or cytocyst perhaps explains the difficulty of staining the parasite. The nucleus of the parasite is round or oval and usually situated close to one end. James describes the parasite as invading the polymorphonuclear leucocytes, but the writer calls attention to the fact that the leucocytes which are invaded are decidedly atypical. He concludes from his work that they are immature leucocytes which were infected in the bone-marrow and retarded in development. Such leucocytes show dense nuclear staining—they may retain some motility but to a slight degree only. Motile vermicules are rarely seen in the blood but they can be studied in the gut of ticks which have fed on infected dogs. The bone-marrow shows other forms which are confined to this tissue. Mature cysts are seen which contain at least 30 sporozoits. The cyst wall is thick and hyaline. The sporozoits are of sausage shape and contain a central, irregular, dark-staining chromatin mass. The less mature cysts are exceedingly resistant to stains and are filled with round, clear, refractile granules of large size. They appear to develop from the ordinary encysted form.

One finds in the marrow and rarely in the circulating blood, round or oval naked forms of the parasite, always in mononuclear cells. This is a less mature stage of the parasite in which the cytocyst is not in evidence and the chromatin mass shows differences.

The sexual cycle takes place in the dog tick in the large cells of the gut where conjugation occurs between two similar vermicules. As a result a globular body is formed containing a single large and homogeneous mass of chromatin. This, after three or four days, splits up to form eleven to fourteen sporozoits, which resemble the original vermicules but are thinner. The method of re-entry into the dog is not clear.

The process is true sporogony while the reproduction in the marrow must be considered as schizogony.

The writer reviews briefly the six hemogregarines which have been described. The article is clearly illustrated. G. H. W.

*Manual of Anatomy, Systematic and Practical, Including Embryology.* By A. M. BUCHANAN, C. M., F. F. P. S., etc., Glasgow. Vol. I, Osteology, Upper Limb; Lower Limb. pp. xvi and 596 + 266 text-figures. Size, 5¾ × 8½ inches. (*Chicago: W. T. Keener & Co., 1906.*)

With commendable frankness the author states that his object has been "to combine a manual of practical anatomy with a text-book of systematic anatomy and so furnish students with a complete treatise on the subject written entirely by himself." (!) He has also aimed "to keep constantly in view the examinational requirements of students." In these words the aim and scope of the manual are well set forth. It is refreshing to find that the author of this carefully done manual, has stated his purpose with such candor for it enables those directing anatomical work to foresee the probable advantages and limitations which the above objects are likely to impose upon any manual of anatomy.

The subject of osteology is treated with clearness and detail. The main variations and the ossification centers of each bone are given with accompanying illustrations for the latter. The illustrations in osteology are fully adequate but occasionally imperfect and in some instances have incomplete legends.

Presumably, in order to avoid repetition, the origins and insertions of the muscles are indicated in these illustrations. Since the muscle attachments are given in red and blue colors they naturally detract somewhat from the value of the illustrations for the purposes of osteology. However, this is a minor matter, if, as is now the custom in our best medical schools, every student is provided with a complete skeleton for home study.

The descriptive text on the anatomy of the upper and lower extremities is an example of judicious condensation. The main facts regarding the muscles are given under the time-honored

headings: Origin, Insertion, Nerve-Supply, Blood-Supply and Action, and a supplementary paragraph is occasionally added on the direction of muscle fibers, etc.

No subject has received undue attention to the exclusion of the rest. The chief facts concerning the lymphatics, nerves, veins, joints, and fasciæ are succinctly stated. All receive as much attention as is possible in a work of this scope. Exceptionally good attention has been paid to the chief arterial anastomoses. The vessels concerned are carefully summarized and usually a good original or selected illustration accompanies the descriptive text. In short, we have here a well-balanced systematic anatomy of small compass.

Following the descriptive text on each extremity, are directions for the dissector. These are explicit and usually follow in such sequence as to permit an orderly exposure of a given area. Since they are separated from the descriptive text which the student would be obliged to consult, it is doubtful whether he would follow them with sufficient care.

Most of the original illustrations are clear and well executed. They show a judicious use of colors, and when in the form of schemes give a clear outline of the related structures. With the exception of Figs. 228, 241, and 242, which lack proportion, and the lymphatic glands as given in Fig. 221, they usually represent anatomical structures faithfully.

We regret exceedingly that the author has practically excluded the B. N. A. from the manual, save as on page 272, where it is used indiscriminately. These, in our opinion, are the main defects. We do find, however, the frequent use of historic names, such as Lisfranc's tubercle, Nelaton's line, Hey's ligament, etc., which we presume answer some of the demands of examinational requirements in Great Britain. It is to be questioned whether the gain to the student in historical perspective through the retention of these names can compensate him for the absence of the accepted anatomical nomenclature of scientific anatomists.

The type is clear, defective letters and words infrequent, and its differential character a great convenience to the student. There is a good index and table of contents and illustrations. We should like to include the word "dry" as applied to the skeleton and the expression "axis spine" among typographical errors.

The paper is of good quality and the binding in flexible covers and English Buchram especially well chosen. The price is reasonable.

S. W. M.

*Diagnostic Methods.* By PROF. HERMANN SAHLI. Being an authorized translation of the fourth (last) German edition, by F. P. KINNICUTT and N. B. POTTER. 8 vo., 1008 pages, numerous illustrations. (*Philadelphia and London. W. B. Sanders Company, 1905.*)

In giving to the profession an English translation of Prof. Sahli's great work, Drs. Kinnicutt and Potter have put us under a real obligation.

Comprising as it does a careful and exhaustive treatise on all the methods, physical and chemical, which are used in medicine, including the special branches, the work is an invaluable source of help to the student and practitioner.

Since its first appearance in 1894, the work has gone through several editions and enlargements and embodies not only a full and critical presentation of current methods and opinions but also a great deal of new matter, the result of investigations by the author, his assistants, and pupils. It is, therefore, not merely a compilation but a contribution to the advancement of medical science.

The sections on physical diagnosis, and those on gastric and urinary diagnosis are particularly worthy of note. In fact, of works covering the whole field of method there is none which is so good.

The American translators have done their work well and have added a number of illustrations and comments of value.

T. R. B.

*Practical Dietetics with Reference to Diet in Disease.* By ALIDA FRANCES POTTER, Graduate, Department of Household Arts, State Normal School, Framingham, Mass., etc. Fourth edition. (*New York: A. F. Potter, Publisher.*)

This book has received unusual commendation from the fact that it has been adopted by the medical department of the U. S. Government, also by the Canadian Government in its schools of instruction for the militia, and has been authorized as a text-book in the New York public schools. In many respects it well deserves these marks of appreciation, but the reviewer feels that before another edition is printed, the work needs very careful revision. In his opinion the best part of the book is the portion devoted to receipts; these are well chosen and simple. Miss Potter uses a "speck" as a measure about equal to ⅛ of a teaspoon,—the old-fashioned "pinch" would seem to be a better word to use, though perhaps quite as inaccurate in exact measurement. Proprietary names of foods should be discarded from such a work; example, Welch's Grape Juice, Horlick's Malted Milk, and others. "Sweetina" should give way to saccharine.

The introductory chapter on digestion could be made clearer were it more simple, and did it not attempt to give in brief form information which cannot be well condensed. The directions for disinfecting utensils are not satisfactory, and the tables of exact equivalents in weights, and for preparing percentage solutions might be omitted.

Miss Potter should eliminate the word "dainty" from her vocabulary, as its frequent recurrence is distasteful. A soup can never be "dainty." The following sentence in the chapter on fruits is perhaps the worst in the book, and should not have been allowed to pass through four editions: the expurgative fluid reaches every part of the system, rinsing out morbid humors, and restoring congestive (!) organs to a healthy state of functional activity. "Pressure on the lungs" for "oppression," also needs correction, and the statement that bananas act as a "stimulant to the nerves" is one that cannot pass unchallenged.

The book has much merit, but the use of the proprietary names of foods diminishes its value and our estimate of it is lowered. We cannot recommend its use until it has been purged of all advertisements.

R. N.

*Twentieth Annual Report of the State Board of Health of the State of Ohio, for the Year ending December 31, 1905.* (*The Springfield Publishing Company, Springfield, Ohio, 1906.*)

This report of nearly 500 pages is interesting and valuable. It demonstrates the good work being done by the State along lines of public hygiene, of which the best proof is the annually diminishing death rate throughout the State. Two-thirds of the report is taken up with papers relating to water supplies and their purification, and the proper disposal of sewage. It is to be greatly desired that the question of tuberculosis should hereafter receive more attention. With the exception of diseases of the nervous system, which, with 4213 deaths, lead the list of diseases in the mortality reported for the year, pulmonary tuberculosis takes second place with 3935 deaths. Doubtless many more died of this disease, but their deaths have been recorded under other heads. This is more than three times the number of those who died from typhoid fever. It is satisfactory to note that but very few deaths, 76, are attributed to malaria, thus showing that the doctors far and wide, are no longer attributing to this disease, as they have done in the past, many obscure forms of death.

It is a proof of the value of persistent and prolonged education along certain definite lines. The health of the United States depends in large measure on the high education of its doctors, and every well-learned lesson of this nature will help to improve the general welfare. R. N.

*Text-Book of Midwifery for Nurses.* By ROBERT JARDINE, M. D., Edin., etc. Third edition. (*London: Henry Kempton; Chicago: W. T. Keener & Co.*)

This is a compact little volume dealing with the practical side of obstetrics. It is very clearly written and would seem well adopted to the needs of nurses, for whom it is intended. The illustrations are few but well chosen.

*The Diseases of Women.* By J. BLAND-SUTTON, F. R. C. S., Eng., and A. C. GILES, M. D., etc. Fifth edition. (*New York: Rebman Co., 1896.*)

That this little volume has entered its fifth edition proves that it has met a need, and it is deservedly popular.

The authors emphasize their endeavor to keep the book in as small a volume as is possible, and they have succeeded admirably. In this small volume every unusual and diseased condition of the reproductive organs of women finds a place, the authors devoting some space to the anomalies due to arrest of development, as as well as to the normal development, anatomy, and physiology of these organs.

Puberty, menstruation and its irregularities, and the menopause are given due consideration; a very welcome addition to a text-book of this character.

A novel departure is the section devoted to the vaginal secretions, both normal and pathological, with an enumeration of the causes, and a graphic description of the physical characteristics of each. There is a long list of the bacteriological findings in the vaginal secretions, given, perhaps, in the order of their frequency, if not in that of their relative importance. The gonococcus of Neisser is placed (5th) fifth in the list, instead of (1st) first, where experience would indicate it belonged, and where the authors practically admit it, in the third paragraph on page 125, and again in section C on page 130. Many of the organisms on the list are rarely seen in practice, and must be classed as belonging to some of the gynæcological curiosities, in which the book abounds. For this wealth of information alone, *i. e.*, reports of the unusual conditions met, the book is well worth the reading.

The descriptions of conditions are clear and concise, and the treatment on the whole conservative and rational, though much of the technique of both treatment and operation had to be sacrificed in the condensation of the volume, which is to be regretted in a text-book for students.

In but two points, the operations as advised, seem not to be up to modern requirement: First, in the repair of perineal lacerations, the old method is continued, instead of the union of the torn muscles, which would seem the logical aim of the operation; and, again, in inoperable cysts of the ovary, the authors advise uniting the edges of the cyst, to the edges of the abdominal wall, even at the risk of the patients dying a miserable death from exhaustion, due to suppuration (page 496). This would not appeal to one as good surgery, even though we realized that the patient would probably die anyhow, it seems cruel to inflict upon a dying patient the constant and painful evidences of her hopeless condition.

As before said, the book deserves its popularity even in spite of the criticism above made. It is well written, both the paper and type are attractive, and the illustrations, though mainly diagrammatic, serve the purpose for which they are intended. If we may use the simile, the book appears "a bird's-eye view" of the field of the diseases of the reproductive organs of women.

*Cook County Hospital Reports, 1906.* Compiled and Edited under the Direction of the Publication Committee of the Cook County Hospital Staff. (*Chicago: The Henry O. Shepard Co., Printers, 1906.*)

This volume is to be welcomed as an index of the spirit of the men who have produced it. The introduction begins thus: "Through the developments and reorganizations of recent years and the co-operation of its medical staff a new, modern hospital has been presented to Cook County, and this little volume is an earnest pledge of the permanency of the gift. The old county institution, reborn and clothed in modern garb, is destined to take a dignified position in the galaxy of real hospitals, whose functions extend infinitely further than to the mere taking care of the indigent poor. Hereafter, it is hoped, it will join with the Johns Hopkins, Massachusetts General, and others of that type in the pursuit of original research, to develop the medical knowledge of the world." The pledge the staff has taken has been well kept, and there is no doubt that in their earnest endeavor to attain the standards set by the hospitals they name, they will in due time produce work as good as that done elsewhere. The hospital has an evil past history, that must be blotted out, and if the present staff do not get dispirited, they can make the hospital one of the notable landmarks of the country. The thirty-six papers in this volume deal with a number of persistently interesting topics to all students of medicine and surgery in their multifold specialties. It is a worthy addition to the already long list of hospital reports. R. N.

*Tumors of the Cerebrum: Their Focal Diagnosis and Surgical Treatment.* By CHARLES K. MILLS, M. D., and others. (*Philadelphia: On sale by Edward Pinnock, 1906.*)

This volume is composed of seven articles, five of which are reprints from the University of Pennsylvania Medical Bulletin for the year 1906; the remaining two have not apparently been published elsewhere, but have been read before societies. All the authors are Philadelphians, so that the volume is valuable as presenting the views of a group of men who are already well known for their admirable work in neurology. Each paper deserves careful study, and the volume as a whole is an important contribution to the literature of these special tumors, which still offer so many difficulties in their correct diagnosis and treatment both to physicians and surgeons. R. N.

## ERRATA.

BENJAMIN RUSH, AS MATERIALIST AND REALIST.

By I. WOODBRIDGE RILEY, PH.D.,

(THE JOHNS HOPKINS HOSPITAL BULLETIN, *March, 1907.*)

Page 91, 1st column, 4th line from bottom, for **Shaftsbury** read *Shaftesbury.*

Page 92, 2d column, 19th line from top, for **quiddites** read *quiddities.*

Page 101, 1st column, 1st line from top, insert *he* after *could.*

*The Johns Hopkins Hospital Bulletins are issued monthly. They are printed by the LORD BALTIMORE PRESS, Baltimore. Single copies may be procured from NUNN & CO., and the BALTIMORE NEWS CO., Baltimore. Subscriptions, $2.00 a year, may be addressed to the publishers, THE JOHNS HOPKINS PRESS, BALTIMORE; single copies will be sent by mail for twenty-five cents each.*